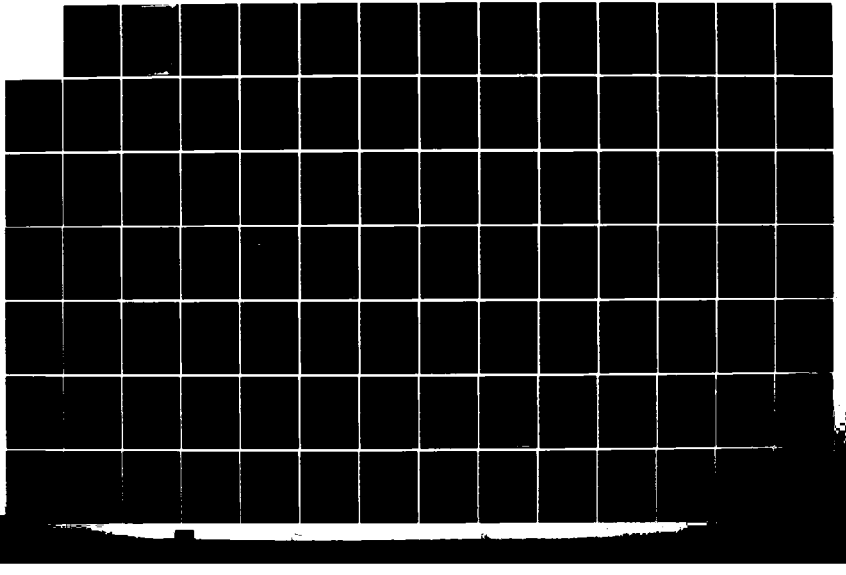
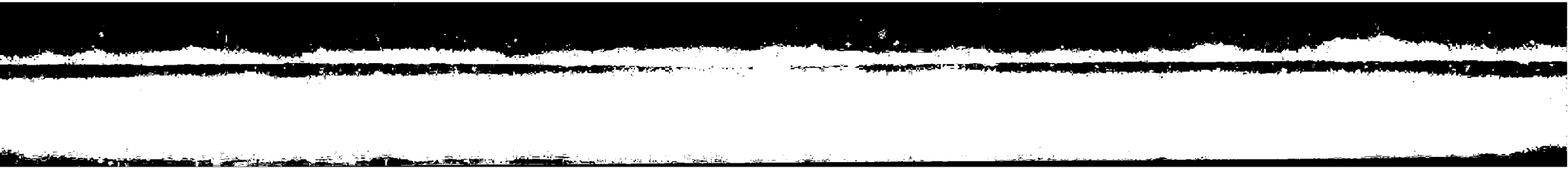
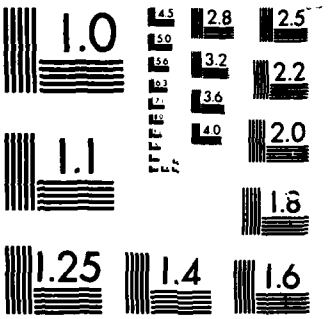
AD-A150 294 W KERR SCOTT RESERVOIR SEDIMENTATION RESURVEYS FOR MAY 1/2
1978 AND SEPTEMBER 1979(U) CORPS OF ENGINEERS
CHARLESTON SC CHARLESTON DISTRICT MAR 80

UNCLASSIFIED F/G 8/8 NL





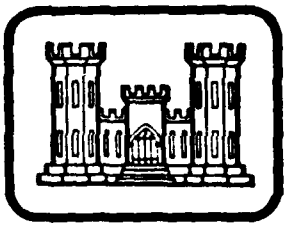


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

REPORT ON SEDIMENTATION RESURVEY

W. KERR SCOTT RESERVOIR

SURVEYS OF MAY 1978 AND SEPTEMBER 1979



U.S. ARMY ENGINEER DISTRICT, CHARLESTON
CORPS OF ENGINEERS
CHARLESTON, SOUTH CAROLINA

MARCH 1980

SACEN-PH 9 October 1980

SUBJECT: Reservoir Sedimentation Data Summary

Division Engineer, South Atlantic
ATTN: SADEN-TH

Pursuant to telephone request by OCE of 6 October 1980, subject as above, item 43 of the reservoir sediment data sheet for W. Kerr Scott Reservoir has been revised to conform to instructions compiled by the Inter-Agency Subcommittee on sedimentation. Five copies are inclosed.

FOR THE DISTRICT ENGINEER:

1 Incl (5 cys)
as

JACK J. LESEMANN
Chief, Engineering Division

Copy furnished:
SAJEN
w/incl

BILLUE/236/kw

MEREDITH/P

LESEMANN/EN

Accession For	
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"Original contains color plates: All DTIC reproductions will be in black and white"

RESERVOIR SEDIMENT DATA SUMMARY

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

W. Kerr Scott Reservoir
NAME OF RESERVOIR

DATA SHEET NO.

DAM

1. OWNER Dept. of Army, C of E	2. STREAM Yadkin	3. STATE North Carolina
4. SEC. TWP. RANGE	5. NEAREST P O Wilkesboro, NC	6. COUNTY Wilkes
7. LAT 36° 9 ' N" LONG 81° 14' W "	8. TOP OF DAM ELEVATION 1,107.5	9. SPILLWAY CREST ELEV. 1,075.0

RESERVOIR

10. STORAGE ALLOCATION	11. ELEVATION TOP OF POOL	12. ORIGINAL SURFACE AREA, ACRES	13. ORIGINAL CAPACITY, ACRE-FEET	14. GROSS STORAGE, ACRE-FEET	15. DATE STORAGE BEGAN
a. FLOOD CONTROL	1,075.0	4,000	112,600	154,000	Aug. 22, 62
b. MULTIPLE USE					
c. POWER					
d. WATER SUPPLY	1,030.0	1,475	33,100	41,400	16. DATE NORMAL OPER BEGAN
e. IRRIGATION					
f. CONSERVATION					
g. INACTIVE	1,000.0	675	8,300	8,300	Jan. 19, 63

WATERSHED

17. LENGTH OF RESERVOIR 4.73 MILES		AV. WIDTH OF RESERVOIR 0.49 MILES	
18. TOTAL DRAINAGE AREA 348 SQ. MI.		22. MEAN ANNUAL PRECIPITATION 52.84 (41) INCHES	
19. NET SEDIMENT CONTRIBUTING AREA 348 SQ. MI.		23. MEAN ANNUAL RUNOFF 22.22 (57) INCHES	
20. LENGTH 38.5 MILES	AV. WIDTH 9.04 MILES	24. MEAN ANNUAL RUNOFF 412,482 AC.-FT.	
21. MAX. ELEV. 4,100	MIN. ELEV. 965.0	25. ANNUAL TEMP MEAN 55.8 RANGE -5 to 98 (16)	

SURVEY DATA

26. DATE OF SURVEY	27. PERIOD YEARS	28. ACCL. YEARS	29. TYPE OF SURVEY	30 NO. OF RANGES OR CONTOUR INT.	31. SURFACE AREA, ACRES	32. CAPACITY, ACRE-FEET	33 C/I RATIO, AC.-FT. PER AC.-FT.
Aug. 1962	-	-	Range	8 Ranges	4,000	154,000	0.40
May 1971	8.8	8.8	Range (D)	20 Ranges	4,000	153,826	0.40
May 1978	7.0	15.8	Range (D)	20 Ranges	4,000	151,700	0.39

26. DATE OF SURVEY	34. PERIOD ANNUAL PRECIPITATION	35. PERIOD WATER INFLOW, ACRE-FEET			36. WATER INFL. TO DATE, AC.-FT.	
		a. MEAN ANNUAL	b. MAX. ANNUAL	c. PERIOD TOTAL	a. MEAN ANNUAL	b. TOTAL TO DATE
Aug. 1962	-	-	-	-	-	-
May 1971	51.5	400,326	496,973	3,502,854	400,326	3,502,854
May 1978	60.78	566,505	694,033	3,965,535	472,683	7,468,389

26 DATE OF SURVEY	37. PERIOD CAPACITY LOSS, ACRE-FEET			38. TOTAL SED. DEPOSITS TO DATE, ACRE-FEET		
	a. PERIOD TOTAL	b. AV. ANNUAL	c. PER SQ. MI.-YEAR	a TOTAL TO DATE	b. AV. ANNUAL	c PER SQ. MI.-YEAR
Aug. 1962	-	-	-	-	-	-
May 1971 1/	140	15.9	.046	140	15.9	.046
May 1978	1191	170.1	.489	1331	84.2	.242

26. DATE OF SURVEY	39. AV. DRY WGT., LBS. PER CU. FT.	40. SED. DEP., TONS PER SQ. MI.-YR.		41 STORAGE LOSS, PCT.		42 SED INFLOW, PPM	
		a PERIOD	b. TOTAL TO DATE	a. AV ANN.	b TOT. TO DATE	a PERIOD	b. TOT TO DATE
Aug. 1962	-	-	-	-	-	-	-
May 1971	No sediment samples taken			.01	.11		
May 1978				.05	.86		

ENG FORM 1787
NOV 68

PREVIOUS EDITIONS ARE OBSOLETE.

Revised October 1980

26. DATE OF SURVEY	43. DEPTH DESIGNATION RANGE IN FEET BELOW, AND ABOVE, CREST ELEVATION											
	115-105	105-95	95-85	85-75	75-65	65-55	55-45	45-35	35-30	30- 0		
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION											
Aug. 1962	-	-	-	-	-	-	-	-	-			
May 1971	9	33	1	15	25	17	-	-	-			
May 1978	10	17	23	17	10	9	14	-	-			

26. DATE OF SURVEY	44. REACH DESIGNATION PERCENT OF TOTAL ORIGINAL LENGTH OF RESERVOIR														
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-105	-110	-115	-120	-125
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN REACH DESIGNATION														

45. RANGE IN RESERVOIR OPERATION

WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, AC.-FT.	WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, AC.-FT
1962 Sep	1,024.8	975.8	27,093	1973	1,044.20	1,025.80	654,455
1963	1,031.1	1,024.8	369,026	1974	1,041.40	1,029.30	611,470
1964	1,032.5	1,026.7	327,642	1975	1,047.30	1,029.10	617,477
1965	1,039.4	1,026.1	496,973	1976	1,043.40	1,023.30	465,284
1966	1,044.0	1,029.7	380,647	1977	1,044.35	1,021.10	473,641
1967	1,031.3	1,029.8	334,730	1978	1,061.20	1,027.00	482,176
1968	1,031.6	1,029.8	440,321	Oct-May			
1969	1,037.3	1,029.4	471,693				
1970	1,060.2	1,028.5	468,121				
1971 2/	1,032.7	1,021.3	426,077				
1972	1,047.7	1,027.65	537,446				

46. ELEVATION-AREA-CAPACITY DATA

ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY
Original Capacity - 1962			1,050	2,225	77,800	1,010	1,025	15,388
970	50	250	1,060	2,775	103,000	1,020	1,225	26,443
980	125	1,125	1,070	3,550	134,500	1,030	1,475	39,701
990	318	3,340	1,075	4,000	154,000	1,040	1,800	55,627
1,000	675	8,300	Capacity - 1978			1,050	2,225	76,500
1,010	1,025	16,700	970	50	75	1,060	2,775	101,700
1,020	1,225	27,900	980	125	667	1,070	3,550	132,700
1,030	1,475	41,400	990	318	2,493	1,075	4,000	151,700
1,040	1,800	57,000	1,000	675	7,169			

47. REMARKS AND REFERENCES

1/ Previous data sheet (June 1972) was to elevation 1,040. Revised to elevation 1,045 for uniformity with 1978 data.

2/ Temporary change in normal pool from elevation 1,030 to 1,033 beginning September 1971 until September 1973.

Sedimentation Reports

W. Kerr Scott Reservoir, Yadkin River, N.C. Surveys of Aug. 1962 and 1971 dated Nov. 1972.

W. Kerr Scott Reservoir, Yadkin River, N.C. Surveys of May 1978 and Sept. 1979, dated Mar. 1980.

48 AGENCY MAKING SURVEY U.S. Army Corps of Engineers

49. AGENCY SUPPLYING DATA Charleston District

50. DATE May 1979

SACEN-PH (31 Mar 80) 4th Ind
SUBJECT: W. Kerr Scott Reservoir, Report on Sedimentation Resurvey

DA, Charleston District, Corps of Engineers, P. O. Box 919, Charleston, South Carolina 29402 23 September 1980

TO: District Engineer, Wilmington, ATTN: SAWEN

The subject report has been approved. Back-up data for this report will be forwarded in the near future.

FOR THE DISTRICT ENGINEER:

wd all incl

JACK J. LESEMANN
Chief, Engineering Division

HAUSER/263/tmc

BILLUE/PH

MEREDITH/P

LESEMANN/EN

SACEN-PH 15 September 1980

SUBJECT: Reservoir Sedimentation Data Summary

Division Engineer, South Atlantic
ATTN: SADEN-TH

1. Pursuant to your letter dated 28 August 1980, subject as above, the reservoir sediment data sheet for W. Kerr Scott Reservoir has been revised to conform to instructions compiled by the Inter-Agency Subcommittee on Sedimentation. Five copies are inclosed.

2. Clarification of OCE comments are as follows:

a. All capacities given in item 32 are for elevation 1075 in accordance with instructions compiled by the Inter-Agency Subcommittee on Sedimentation.

b. The sediment accumulation of 174 acre-ft in item 37a was measured to elevation 1040. This value has been revised to reflect sediment accumulation to elevation 1045. This was done for uniformity since the 1978 data for this item was measured to elevation 1045. Footnote 1 on the new summary sheet (Inclosure 1) reflects this change.

FOR THE DISTRICT ENGINEER:

1 Incl (5 cys)
as

JACK J. LESEMANN
Chief, Engineering Division

HAUSER/263/pm

BILLUE/PH

MEREDITH/P

LESEMANN/EN

RESERVOIR SEDIMENT DATA SUMMARY

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

W. Kerr Scott Reservoir
NAME OF RESERVOIR

DATA SHEET NO.

DAM

1. OWNER Dept. of Army, C of E	2. STREAM Yadkin	3. STATE North Carolina
4. SEC. TWP. RANGE	5. NEAREST P O Wilkesboro, NC	6. COUNTY Wilkes
7. LAT 36° 9 ' N" LONG 81° 14' W"	8. TOP OF DAM ELEVATION 1,107.5	9. SPILLWAY CREST ELEV 1,075.0

RESERVOIR

10. STORAGE ALLOCATION	11. ELEVATION TOP OF POOL	12. ORIGINAL SURFACE AREA, ACRES	13. ORIGINAL CAPACITY, ACRE-FEET	14. GROSS STORAGE, ACRE-FEET	15. DATE STORAGE BEGAN
a. FLOOD CONTROL	1,075.0	4,000	112,600	154,000	Aug. 22, 62
b. MULTIPLE USE					
c. POWER					
d. WATER SUPPLY	1,030.0	1,475	33,100	41,400	16. DATE NORMAL OPER. BEGAN
e. IRRIGATION					
f. CONSERVATION					
g. INACTIVE	1,000.0	675	8,300	8,300	Jan. 19, 63

17. LENGTH OF RESERVOIR 4.73 MILES | AV. WIDTH OF RESERVOIR 0.49 MILES

WATERSHED

18. TOTAL DRAINAGE AREA 348 SQ. MI.		22. MEAN ANNUAL PRECIPITATION 52.84 (41)	INCHES
19. NET SEDIMENT CONTRIBUTING AREA 348 SQ. MI.		23. MEAN ANNUAL RUNOFF 22.22 (57)	INCHES
20. LENGTH 38.5 MILES	AV. WIDTH 9.04 MILES	24. MEAN ANNUAL RUNOFF 412,482	AC.-FT.
21. MAX. ELEV. 4,100	MIN. ELEV. 965.0	25. ANNUAL TEMP MEAN 55.8 RANGE -5 to 98 (16)	

SURVEY DATA

26. DATE OF SURVEY	27. PERIOD YEARS	28. ACCL. YEARS	29. TYPE OF SURVEY	30 NO. OF RANGES OR CONTOUR INT.	31. SURFACE AREA, ACRES	32. CAPACITY, ACRE-FEET	33 C/I RATIO, AC.-FT PER AC.-FT.
Aug. 1962	-	-	Range	8 Ranges	4,000	154,000	0.40
May 1971	8.8	8.8	Range (D)	20 Ranges	4,000	153,826	0.40
May 1978	7.0	15.8	Range (D)	20 Ranges	4,000	151,700	0.39

26. DATE OF SURVEY	34. PERIOD ANNUAL PRECIPITATION	35. PERIOD WATER INFLOW, ACRE-FEET			36. WATER INFL. TO DATE, AC.-FT.	
		a. MEAN ANNUAL	b. MAX. ANNUAL	c. PERIOD TOTAL	a. MEAN ANNUAL	b. TOTAL TO DATE
Aug. 1962	-	-	-	-	-	-
May 1971	51.5	400,326	496,973	3,502,854	400,326	3,502,854
May 1978	60.78	566,505	694,033	3,965,535	472,683	7,468,389

26. DATE OF SURVEY	37. PERIOD CAPACITY LOSS, ACRE-FEET			38. TOTAL SED. DEPOSITS TO DATE, ACRE-FEET		
	a. PERIOD TOTAL	b. AV. ANNUAL	c. PER SQ. MI.-YEAR	a TOTAL TO DATE	b. AV. ANNUAL	c PER SQ. MI.-YEAR
Aug. 1962	-	-	-	-	-	-
May 1971 1/	140	15.9	.046	140	15.9	.046
May 1978	1191	170.1	.489	1331	84.2	.242

26. DATE OF SURVEY	39. AV DRY WGT., LBS. PER CU. FT.	40 SED DEP., TONS PER SQ. MI.-YR.		41 STORAGE LOSS, PCT.		42. SED. INFLOW, PPM	
		a. PERIOD	b. TOTAL TO DATE	a AV ANN.	b. TOT TO DATE	a. PERIOD	b. TOT TO DATE
Aug. 1962	-	-	-	-	-	-	-
May 1971	No sediment samples taken			.01	.11		
May 1978				.05	.86		

ENG FORM 1787 NOV 68 PREVIOUS EDITIONS ARE OBSOLETE.

Revised September 1980

26. DATE OF SURVEY	43. DEPTH DESIGNATION RANGE IN FEET BELOW, AND ABOVE, CREST ELEVATION										
	115-105	105-95	95-85	85-75	75-65	65-55	55-45	45-35	35-30	30- 0	
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION										
Aug. 1962	-	-	-	-	-	-	-	-	-		
May 1971	15.7	59.3	-29.3	26.4	45.7	30.7	-0.7	-20.0	-27.8		
May 1978	13.1	21.3	29.2	21.7	13.6	10.9	18.2	-24.5	- 3.5		

26. DATE OF SURVEY	44. REACH DESIGNATION PERCENT OF TOTAL ORIGINAL LENGTH OF RESERVOIR														
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-105	-110	-115	-120	-125
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN REACH DESIGNATION														

45. RANGE IN RESERVOIR OPERATION

WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, AC.-FT.	WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, AC.-FT.
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1963	1,031.1	1,024.8	369,026	1974	1,041.40	1,029.30	611,470
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1967	1,031.3	1,029.8	334,730	1978	1,061.20	1,027.00	482,176
1968	1,031.6	1,029.8	440,321	Oct-May			
1969	1,037.3	1,029.4	471,693				
1970	1,060.2	1,028.5	468,121				
1971 2/	1,032.7	1,021.3	426,077				
1972	1,047.7	1,027.65	537,446				

46. ELEVATION-AREA-CAPACITY DATA

ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY
Original Capacity - 1962			1,050	2,225	77,800	1,010	1,025	15,388
970	50	250	1,060	2,775	103,000	1,020	1,225	26,443
980	125	1,125	1,070	3,550	134,500	1,030	1,475	39,701
990	318	3,340	1,075	4,000	154,000	1,040	1,800	55,627
1,000	675	8,300	Capacity - 1978			1,050	2,225	76,500
1,010	1,025	16,700	970	50	75	1,060	2,775	101,700
1,020	1,225	27,900	980	125	667	1,070	3,550	132,700
1,030	1,475	41,400	990	318	2,493	1,075	4,000	151,700
1,040	1,800	57,000	1,000	675	7,169			

47. REMARKS AND REFERENCES

1/ Previous data sheet (June 1972) was to elevation 1,040. Revised to elevation 1,045 for uniformity with 1978 data.

2/ Temporary change in normal pool from elevation 1,030 to 1,033 beginning September 1971 until September 1973.

Sedimentation Reports

W. Kerr Scott Reservoir, Yadkin River, N.C. Surveys of Aug. 1962 and 1971 dated Nov. 1972.

W. Kerr Scott Reservoir, Yadkin River, N.C. Surveys of May 1978 and Sept. 1979, dated Mar. 1980.

48. AGENCY MAKING SURVEY U.S. Army Corps of Engineers

49. AGENCY SUPPLYING DATA Charleston District

50. DATE May 1979

DEPARTMENT OF THE ARMY
SOUTH ATLANTIC DIVISION, CORPS OF ENGINEERS
510 TITLE BUILDING, 30 PRYOR STREET, S.W.
ATLANTA, GEORGIA 30303

REPLY TO
ATTENTION OF:

SADEN-TH

28 August 1980

SUBJECT: Reservoir Sedimentation Data Summary

District Engineer, Charleston, ATTN: SACEN-PH

1. Reference is made to DAEN-CWE-HY letter dated 8 August 1980, subject as above.

2. The reservoir sediment data sheet for W. Kerr Scott Reservoir should be revised according to OCE comments noted in Inclosure 1. The Inter-Agency Subcommittee on Sedimentation have compiled instructions for completing sediment data forms and they are inclosed for your information and use. Also inclosed is the SCS-34 Form which is referenced on page 2 of the W. Kerr Scott sediment data summary form.

3. The revised summary form should be submitted to SADEN-TH by 25 September 1980.

FOR THE DIVISION ENGINEER:

for C P Davis
WILLIAM N. McCORMICK, JR.
Chief, Engineering Division

3 Incl
as

ACTION COPY EM-

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314

REPLY TO ATTENTION OF:

DAEN-CWE-HY

8 August 1980

SUBJECT: Reservoir Sedimentation Data Summary

SEE DISTRIBUTION

1. The Soil Conservation Service has returned the attached annotated reservoir sediment data summary sheets with the general comments and problems for resolution of questionable items.

2. FOA's are requested to furnish HQDA (DAEN-CWE-HY) the revised version by 1 October 1980.

3. For further information concerning this request, please contact Dr. Yung H. Kuo, DAEN-CWE-HY, (202) 272-0224.

FOR THE CHIEF OF ENGINEERS:

2 Incl
1. Res. Sed. Data Sum.
2. Gen. Comments

LLOYD A. DUSCHA
Chief, Engineering Division
Directorate of Civil Works

DISTRIBUTION
(See page 2)

Incl 1

DAEN-CWE-HY 8 August 1980

SUBJECT: Reservoir Sedimentation Data Summary

DISTRIBUTION:

Division Engineer, Lower Mississippi Valley, ATTN: LMVED
Division Engineer, Missouri River, ATTN: MRDED
Division Engineer, North Atlantic, ATTN: NADEN
Division Engineer, North Central, ATTN: NCDED
Division Engineer, Ohio River, ATTN: ORDED
✓ Division Engineer, South Atlantic, ATTN: SADEN
Division Engineer, South Pacific, ATTN: SPDED
Division Engineer, Southwestern, ATTN: SWDED

RESERVOIR SEDIMENT
DATA SUMMARY

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

W. Kerr Scott Reservoir
NAME OF RESERVOIR

6-14
DATA SHEET NO

DAM

1 OWNER Dept. of Army, C of E	2 STREAM Yadkin	3 STATE North Carolina
4 SEC TWP RANGE	5 NEAREST P O Wilkesboro, NC	6 COUNTY Wilkes
7 LAT 36° 9' N "LONG 81° 14' W"	8 TOP OF DAM ELEVATION 1,107.5	9 SPILLWAY CREST ELEV 1,075.0

RESERVOIR

10 STORAGE ALLOCATION	11 ELEVATION TOP OF POOL	12 ORIGINAL SURFACE AREA ACRES	13 ORIGINAL CAPACITY ACRE FEET	14 GROSS STORAGE ACRE FEET	15 DATE STORAGE BEGAN
a FLOOD CONTROL	1,075.0	4,000	112,600	154,000	Aug.22, 62
b MULTIPLE USE					
c POWER					
d WATER SUPPLY	1,030.0	1,475	33,100	41,400	DATE NOR MAL OPER BEGAN
e IRRIGATION					
f CONSERVATION					
g INACTIVE	1,000.0	675	8,300	8,300	Jan.19, 63

WATERSHED

17 LENGTH OF RESERVOIR 4.73 MILES		AV WIDTH OF RESERVOIR 0.49	MILES
18 TOTAL DRAINAGE AREA 348 SQ MI		22 MEAN ANNUAL PRECIPITATION 51.52 (34)	INCHES
19 NET SEDIMENT CONTRIBUTING AREA 348 SQ MI		23 MEAN ANNUAL RUNOFF 21.01 (49)	INCHES
20 LENGTH 38.5 MILES	AV WIDTH 9.04 MILES	24 MEAN ANNUAL RUNOFF 384,934	AC FT
21 MAX ELEV 4,100	MIN ELEV 965.0	25 ANNUAL TEMP MEAN 55.8	RANGE -5 to 98 (16)

SURVEY DATA

26 DATE OF SURVEY	27 PERIOD YEARS	28 ACCL YEARS	29 TYPE OF SURVEY	30 NO OF RANGES OR CONTOUR INT	31 SURFACE AREA ACRES	32 CAPACITY ACRE FEET	33 RATIO AC FT PER AC FT
Aug. 1962	-	-	Range	8 Ranges	4,000	154,000	0.40
May 1971	8.8	8.8	Range Detailed	20 Ranges	4,000	153,826	0.40

26 DATE OF SURVEY	34 PERIOD ANNUAL PRECIPITATION	35 PERIOD WATER INFLOW, ACRE-FEET a MEAN ANNUAL	b MAX ANNUAL	c PERIOD TOTAL	36 WATER INFL TO DATE AC FT a MEAN ANNUAL	b TOTAL TO DATE
Aug. 1962	-	-	-	-	-	-
May 1971	51.5	400,326	496,973	3,502,854	400,326	3,502,854

26 DATE OF SURVEY	37 PERIOD CAPACITY LOSS, ACRE-FEET a PERIOD TOTAL	b AV ANNUAL	c PER SQ MI YEAR	38 TOTAL SED DEPOSITS TO DATE ACRE-FEET d TOTAL TO DATE	e AV ANNUAL	f PER SQ MI YEAR
Aug. 1962	-	-	-	-	-	-
May 1971	174 1/	19.8	.056	174	19.8	.056

26 DATE OF SURVEY	39 AV DRY WGT LBS PER CU FT	40 SED DEP TONS PER SQ MI YR a PERIOD	b TOTAL TO DATE	41 STORAGE LOSS PCT c AV ANN	d TOT TO DATE	42 SED INFLOW, PPM e PER YR	f TOT TO DATE
Aug. 1962	-	-	-	-	-	-	-
May 1971	No sediment	samples taken		.01	.11		

ENG FORM 1787 NOV 66 PREVIOUS EDITIONS ARE OBSOLETE

Cap 154,000 was at elev 1075
Cap 153,826 was at elev 1040 (estimated)
Other losses measured from above two points.
Footnote 1 indicates that measurements were at elev 1040.

26 DATE OF SURVEY	43 DEPTH DESIGNATION RANGE IN FEET BELOW AND ABOVE CREST ELEVATION									
	Inactive Pool		Water Supply Pool			Flood Control Pool to El. 1040				
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION									
Aug. 1962	-	-	-	-		-	-			
May 1971	58%		58.6%			-16.6%				

27 DATE OF SURVEY	44 REACH DESIGNATION PERCENT OF TOTAL ORIGINAL LENGTH OF RESERVOIR													
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-105	-110	-115	
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN REACH DESIGNATION													

45 RANGE IN RESERVOIR OPERATION

WATER YEAR	MAX ELEV	MIN ELEV	INFLOW, AC FT	WATER YEAR	MAX ELEV	MIN ELEV	INF
1962 Sep	1,024.8	975.8	27,093				
1963	1,031.1	1,024.8	369,026				
1964	1,032.5	1,026.7	327,642				
1965	1,039.4	1,026.1	496,973				
1966	1,044.0	1,029.7	380,647				
1967	1,031.3	1,029.8	334,730				
1968	1,031.6	1,029.8	440,321				
1969	1,037.3	1,029.4	471,693				
1970	1,060.2	1,028.5	468,121				
1971 Oct-May	1,032.7	1,026.0	302,491				

46 ELEVATION-AREA-CAPACITY DATA 2/

ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY	ELEVATION	AREA
970	50	250	1040	1800	57,000		
980	125	1125	1050	2225	77,800		
990	318	3340	1060	2775	103,000		
1000	675	8300	1070	3550	134,500		
1010	1025	16700	1075	4000	154,000		
1020	1225	27900					
1030	1475	41400					

47 REMARKS AND REFERENCES

1/ Due to inadequacies of 1962 survey, data reflects sediment accumulated elevation 1040.

2/ The total capacity reduction to the elevation studied (1040) is so sma adjustment was made to the original capacity curve at this time.

48 AGENCY MAKING SURVEY Corps of Engineers

49 AGENCY SUPPLYING DATA Charleston District

50 DATE June 197

C.E

LEGEND (To accompany annotated reservoir survey data sheets)

DNC: Does not comply with instructions provided by the Subcommittee on Sedimentation (ICWR), Rev. 3/66.

NCOMP: Data not compatible with preceding or proceeding items for purposes of determining net change.

PL47: Item should be placed in the remarks section.

Inc 1 2

COMMENTS ON RESERVOIR SEDIMENTATION SURVEYS

Field Work

Range spacing - a great variability exists, as would be expected, considering the great variety of natural conditions. However, ranges spaced hundreds of thousands of feet apart make you wonder about the validity of the work.

Density samples represent the weakest link in the reservoir survey. Estimates are out. Determination of densities from numerous samples is required. Consider the variation possible within a reservoir on a given survey (100%). Lateral and vertical density distribution must be considered in order to provide a reasonable weighted average. Density sectioning would be appropriate. A 100-acre lake sampled at five locations seems unreasonable.

Watershed conditions have been practically overlooked. Do you do more than give a percent of land use or geologic formations? At the present time, each survey should produce a watershed condition map, showing where and how such things as construction, agriculture, etc., are occurring. Have you included stream density, stream lengths, cover conditions, etc., in your report? (Not on 34)

Nonfield

These comments relate mostly to the information presented on the Form 34.

Submerged, aerated, and combined unit weights and resulting computations (items 40 and 41) should be reported separately for each survey.

Report the water surface elevation on the date of survey.

Item 32 (capacity) should be reported for the same elevation on each survey. Several capacities can be reported such as sediment pool, total, etc., and computed separately.

The number of ranges and the contour interval should be reported if a range-contour survey is used.

Indicate if any portion of the total pool was not sampled for sediment density or volume. Is the water level usually at the principal spillway crest? Is the sediment pool wet?

Report unit weights as submerged, aerated, or compounded, as well as belonging to the sediment pool or the detention pool. Sediment pool weights might be aerated.

Average footnotes on continuation sheets in order. Eliminate footnotes with the same number.

Look over previous reports - is what you are reporting reasonable and compatible with previous surveys?

Complete all information on the forms. Indicate where and if additional information is available.

"Duplicate" area-capacity tables provided on continuation sheets are inconsistent--how?

PROBLEMS

Field Use of Form - Reservoir Sedimentation Data Sheet

1. Items 27 to 32 do not contain enough information to compute sedimentation (item 37).
2. Nonsedimentation survey data should be put into item 47.
3. Elevation-area capacity data does not include crest elevation or other elevations which correspond to specific allocations.
4. Elevation-area capacity data for new surveys contains no area information.
5. Items 43, unclear depth designations (we have been inputting depths or elevations).
6. "Assumed" note added, but nothing in text has an asterisk.
7. Date normal operation began, item 16, not completed.
8. Surveys not made to the spillway crest elevation, only to normal pool, yet reservoir operation data shows inflows exceeding normal elevation.
9. Capacity under item 32 for original does not correspond to anything under 14.
10. Under item 46, area measurements subsequent to original survey are not included or indicated as maybe unchanged.
11. Reference is made to additional sheets which are missing.
12. Spillway crest elevation does not match maximum pool elevation, with no explanation.
13. Footnotes in 47 not identified with anything on the sheet.
14. Lowest elevation in elevation-capacity data (46) is lower than lowest watershed elevation (21).
15. No date for item 46.
16. Contour interval is indicated for a range survey, also a 200' C.I.
17. Lowest watershed elevation (21) is higher than stated pool elevation (11).
18. Original capacities do not sum correctly to gross storage (14).

19. Items in parentheses are unexplained.

20. Maximum pool allocations not included in 11-14, but in 47.

21. Type of survey not indicated.

22. Reservoir cleanout not clearly indicated.

23. Capacity at each survey not indicated, nor period or total sediment deposits.

SUBCOMMITTEE ON SEDIMENTATION (ICWR)

INSTRUCTIONS FOR COMPILING THE RESERVOIR SEDIMENT DATA SUMMARY FORM

Prepared by the following agencies represented on the Subcommittee on Sedimentation Inter-Agency Committee on Water Resources

DEPARTMENT OF AGRICULTURE
- Agricultural Research Service
- Forest Service
- Soil Conservation Service

DEPARTMENT OF COMMERCE
- Bureau of Public Roads
- Environmental Science Services Administration

DEPARTMENT OF DEFENSE
- Corps of Engineers
- Naval Oceanographic Office

DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
- Water Pollution Control Administration

DEPARTMENT OF THE INTERIOR
- Bureau of Mines
- Bureau of Reclamation
- Geological Survey

FEDERAL POWER COMMISSION

TENNESSEE VALLEY AUTHORITY

Foreword

(REVISED MARCH 1966)

The following instructions were prepared by members of the Subcommittee as a guide for use in the completion of Reservoir Sediment Data Summary forms. The purpose of the summary form is to provide for the uniform compilation and dissemination of pertinent basic data obtained from reservoir sedimentation surveys. A summary is desired for each reservoir on which one or more sedimentation surveys have been made. New summaries should be prepared when additional sedimentation surveys are made and should carry forward the results of previous surveys, as indicated in the instructions. A typed copy of each new summary in condition suitable for offset printing should be furnished for publication. After a summary is prepared it will be reproduced by the Subcommittee in sufficient numbers to meet the needs of each agency represented on the Subcommittee. This will permit each agency to maintain a file of basic data prepared in a uniform manner suitable for analysis and interpretation. The Subcommittee recognizes that all items of data provided for on the summary will not be readily available for every reservoir. The early compilation and dissemination of available data is preferable to postponement until all items can be completed. However, it is important that every item be filled out for which data are obtainable. The following instructions are based on the instructions issued by the Subcommittee on Sedimentation in 1961 but are revised to apply to the new summary form.

Encl. 2

General Notes

A. In all cases where data are estimated or assumed, insert an asterisk, and show an asterisk with the word "assumed" at the bottom of the front page of the form.

B. Where other information is presented that needs clarification, footnotes should be used and shown by numbers, as 1/, 2/, etc. All footnotes are to be explained in the space provided under Item 47.

C. All data should be shown to at least three significant figures, if available, and if accuracy of the survey warrants. However, it is common practice and permissible to show all items of data to the nearest whole number, even though the accuracy of the survey may not give significance to the last one or two whole numbers. For example, for Item 14: 167,624, 16,762, 1676, 168, 16.8, 1.68.

D. Items 31, 32, 33, 37, 38, 40, 41.
Where the sedimentation survey of a multiple-purpose reservoir has covered only the pool level or levels used for storage most of the year (as irrigation, power, inactive) and has not covered the flood-control pool above such levels, the data should be shown for the pool levels surveyed. However, any data obtained concerning sedimentation in the controllable flood-control pool (not including surcharge storage) should be shown under the above items with a footnote reference of explanation under Item 47.

E. Use continuation sheets when all data cannot be placed on one sheet.

Specific Items

Name of Reservoir: Give the official or most commonly used name. If the dam has another name, give it in parentheses, i.e., Lake Mead (Hoover Dam).

Data Sheet No.: The Data Sheet Number is composed of two parts, the first being the river basin map number as shown in the hydrologic atlas compiled under the auspices of the Subcommittee on Hydrology, ICWR, and the second is the sheet reference number supplied by the Subcommittee on Sedimentation periodically when data are compiled for publication. If the map number for the river basin in which the reservoir is located is available, it should be shown here. The data sheet reference number will be supplied later by the Subcommittee on Sedimentation.

Item

1. The name of the person or the organization that owns or operates the structure. If a Federal or State government, give both the department and agency having supervision or control over the operation of the dam. (Abbreviate as necessary).

2. If the reservoir is located on a small stream, the name of which is not known, list as a tributary of the next largest stream.

For example, "Trib. of Rock R."

3. If the dam lies in two states, both states should be given, the first state being that in which the headquarters for operation of the dam are located.

4. Give the location of the dam by section, township and range.

5. Give the name of the nearest post office. If space permits, adding the distance in miles and direction of the dam from the nearest post office helps to pinpoint the location of the dam, as Tulsa 2 SE.

6. Give the county in which the dam is located. If the dam is in two counties, the first-named county should be the one in which headquarters for operation of the dam are located, followed by a hyphen and the name of the second county.

7. Give the latitude and longitude of the dam in degrees and minutes (seconds, if known).

In Items 8, 9 and 21, if no actual sea level datum elevation is available, an assumed elevation or local datum plane should be given for these items wherever possible, so that the height of the dam and the spillway above stream bed can be determined. (Observe A under General Notes, page 2.)

8. The elevation of the top of the dam which is equal to the highest spillway elevation (Item 9) plus freeboard.

9. This is the elevation of the highest spillway. If the spillway is topped by movable gates, give the elevation of the top of the gates in closed position, with an explanatory footnote in Item 47, "REMARKS AND REFERENCES." (See B under General Notes, page 2.)

10-14. All data corresponding to storage allocations 10a-g refer to original storages in the reservoir, if these data are available, or otherwise, to the first accurate capacities determined after the beginning of storage. Show revisions of the initial storages if recent surveys yield more accurate data than the early surveys.

10a-b. These items designate the purpose of storage space allocation. Multiple use storage space (Item 10b) refers to that which is purposely varied, seasonally or alternately, as required to serve two or more purposes. Use a footnote to explain the specific uses in Item 47.

10c. This item ordinarily refers to storage for hydroelectric or direct power development. However, storage developed or allocated specifically for cooling purposes in steam power plant operation should be listed under this item with a footnote explanation in Item 47.

10d. This item refers to water supply for municipal, industrial, domestic or livestock use, and fire protection.

10e. This item refers to storage space allocated specifically for water used to irrigate agricultural land.

10f. This item refers to storage allocated for regulation of low-water flow of streams, navigation pools, recharge of ground water, recreation, fish and wildlife, etc. Specify by footnote.

10g. This refers to storage below the lowest outlet in the dam which cannot be withdrawn for any consumptive or beneficial use and is not generally considered to be of significant value for any purposes listed under Item 10f, "Conservation". This pool elevation in small reservoirs generally is considered by the Department of Agriculture to be the sediment pool elevation. It is the level below which sediment is generally continually submerged and above which the sediment deposits tend to be more compacted due to periodic exposure to the air.

11a-g. These elevations should correspond to the top of pools listed under Item 10, in terms of mean sea level, if known. Otherwise, an assumed elevation or local datum should be given, as relative elevation to the streambed level, the top of the dam or the spillway crest. If regulation schedules provide for variation (seasonal or otherwise) in the top-of-pool levels the maximum elevation should be shown with a reference to the footnote explanation of the other pertinent pool levels.

12a-g. Give the original surface area in acres at the elevation at the top of each pool shown in Item 11.

13a-g. Give the original storage capacity in acre-feet in each allocation.

14a-g. Give the total original accumulated storage in acre-feet from the bottom of the reservoir to the top of each pool elevation indicated. Thus, the uppermost item recorded should be the original capacity of the reservoir below the spillway crest elevation shown in Item 9.

15. Give the date when water was first impounded (month, day, and year, if possible).

16. Give the date (month, day, and year, if possible) that the initial operation for any function started.

17. Give the length of the reservoir, from the dam to the head of the backwater of the contributing stream. If the reservoir is composed of two or more principal arms, give the sum of the lengths and specify the length of each main arm in a footnote in Item 47. Give the average width by dividing the surface area by the summation of the lengths.

18. Give the entire flow-contributing drainage area above the dam.

19. Give the drainage area exclusive of the surface area of the reservoir at the spillway crest elevation (Item 9) and exclusive of the upstream non-contributing basins or the watersheds above the larger reservoirs that are effective sediment traps.

20. Give the length of the total drainage area along the center line of the main stream valley. The average width is the area in Item 18 divided by the length in Item 20.

21. The maximum elevation would be the highest point of the watershed boundary. The minimum elevation of the watershed should be the lowest original stream-bed elevation at the axis of the dam. This elevation is used to determine the height of the dam.

22-24. Give the longest available recorded mean value. If known, include in parentheses the number of years of record.

22. Give the average annual precipitation value for the total drainage area. If the mean annual precipitation varies widely for different parts of the watershed, record the range of values, for example, "18-35".

23. Mean annual runoff in inches may be obtained from direct measurement; from published reports such as USGS Water Supply Papers; by transposing known data from similar adjacent watersheds; or from average annual runoff maps such as USGS Circular 52. The source of data may be shown by footnote with explanation under Item 47.

24. The mean annual runoff in acre-feet may be obtained by multiplying Item 23, mean annual runoff in inches, by Item 18, total drainage area in sq. mi., times the conversion factor 53.33.

25. The mean annual temperature and the average annual range in temperature should be given in degrees Fahrenheit.

26. Give the date of the beginning of storage, if used to compute sedimentation, or the average date (month, day, and year) of the first reservoir survey, and of all succeeding surveys used in computing sedimentation. The original data from which the sedimentation record begins and the subsequent data should be given under Items 26, 29, 30, 31, 32, and 33, but the original data should not be repeated under Item 26 below or in parallel boxes from Item 34 through Item 42, inclusive.

27. Give the elapsed period between the beginning of storage or the first survey used to compute sedimentation (whichever is the more recent date) and between the average dates of each succeeding sedimentation survey. Compute to the nearest 0.1 year. If computations have been carried out to the nearest 0.01 year, two decimal places may be shown.

28. Give the accumulative period from the beginning of storage or the first survey used to compute the sedimentation (whichever is the more recent date) to each succeeding sedimentation survey. Compute to the nearest 0.01 year, two decimal places may be shown.

29. Indicate "Range" or "Contour" and "Detailed" or "Reconnaissance" as applicable. Detailed may be shown by the symbol "(D)"; reconnaissance by "(R)". A detailed range survey is defined as one in which instrumental control of all sounding and spudding positions in the lake was maintained. Where this was not done, the survey should be labeled as "(R)". In a few cases, where instrumental control was not maintained, but the number of ranges and observations per range were substantially the same as those made on a detailed survey the designation "Semi-Detailed" may be used. The symbol for this should be "(S)". A contour survey to be labeled "(D)" should conform with at least standards of third order accuracy for topographic mapping (1 in 5000). If the contouring was of a sketchy or very generalized nature, designation should be "(R)". All contouring done with Kelsh Plotters and similar equipment shall be considered "(D)", but sketching of contours with portable stereoscope shall be considered "(R)".

30. Give the number of ranges or the contour interval. If a reconnaissance survey, give the number of individual measurements. The letter "(M)" should follow to indicate that they are measurements and not ranges. Where a combination range and contour survey is made the symbol "(R)" should follow the number of ranges and "(CI)" should follow the contour interval.

31. The surface area at the spillway crest elevation (use the elevation of Item 9 to obtain the first entry). If the areas of different allocated storages have been determined each should be referenced with a footnote to be shown in Item 47.

32. The first figure entered should be the original capacity (below the spillway crest elevation, Item 9). If the capacities for different allocated storages have been determined these should be shown and each referenced with a footnote in Item 47. If the original capacity was not determined, give the first accurate capacity determined after the beginning of storage and note the date.

33. Capacity-Inflow ratio. C/I = Item 32 ÷ Item 24. Use the maximum capacity for the date (Item 32) for which the C/I ratio is being calculated and divide by the mean annual runoff in acre-feet (Item 24). This ratio should be adjusted if there are one or more upstream reservoirs that have a significant trap efficiency and control a substantial part of the drainage area (usually more than 25 percent).

34. Give the mean annual precipitation over the drainage area for each period of years given in Item 27. If there is a substantial variation in precipitation for different parts of the drainage area, give the range as "10-23".

35. In 35a give the average annual water inflow to the reservoir, in acre-feet, for each period of years given in Item 27. The highest

annual for each period, in acre-feet, is to be given in Item 35b, and the total for each period is given in Item 35c.

36. Give the water inflow, in acre-feet, to the reservoir for the accumulated periods of years given in Item 28.

37. In Item 37a, give the volume of capacity loss below crest (Item 9) for the periods of years given in Item 27. Item 37b is obtained by dividing the volume given in Item 37a by the corresponding period of years shown in Item 27. Item 37c is obtained by dividing the value in 37b by the net sediment contributing area shown in Item 19.

38. In Item 38a give the accumulative total sediment deposits below crest for the period or periods of years given in Item 28. Item 38b is obtained by dividing the value of Item 38a by the corresponing accumulative years shown in Item 28. Item 38c is determined by dividing Item 38b by the net sediment contributing area shown in Item 19. If the above-crest deposits exist and are measured, add their volume to the below-crest deposits in Items 38a, b, and c, and also give these total values just under the other values. Where above-crest deposits are included, they should be referenced with a footnote and explained in Item 47, REMARKS AND REFERENCES. (See Notes C and D).

39. Weighted average dry weight in pounds per cubic foot of sediment in place in the reservoir. Since the dry weight of deposits tends to increase with time due to compaction, an average dry weight for the total deposit should be measured or estimated at the time of each survey. If assumed values are used, indicate by asterisk. (See Note A).

40. Compute the values as follows:

Item 40a = for first survey, Item 38c x Item 39 x 21.78

Item 40a = for subsequent surveys:

$$\frac{\left[\left(\begin{matrix}\text{Item 38a}\\ \text{for latest}\\ \text{survey}\end{matrix} \times \begin{matrix}\text{Item 39}\\ \text{for latest}\\ \text{survey}\end{matrix}\right) - \left(\begin{matrix}\text{Item 38a}\\ \text{for preced-}\\ \text{ing survey}\end{matrix} \times \begin{matrix}\text{Item 39}\\ \text{for preced-}\\ \text{ing survey}\end{matrix}\right)\right]}{(\text{Item 27 for latest period}) \times (\text{Item 19})} \quad 21.78$$

It is imperative that samples of the sediment representative of the entire period of sediment accumulation be obtained at the time of each survey.

Item 40b = Item 38c x Item 39 x 21.78

41. Compute the values as follows:

$$\text{Item 41a} = \frac{\text{Item 38b}}{\text{Item 14}} \times 100 \quad \text{(Maximum value in item)}$$

$$\text{Item 41b} = \frac{\text{Item 38a} \times 100}{\text{Item 14 (Maximum value in item)}}$$

42. Compute as follows:

$$\text{Item 42a} = \frac{\text{Item 40a} \times \text{Item 27} \times \text{Item 19} \times 10^6}{\text{Item 35c} \times 1359} = \text{PPM by weight}$$

$$\text{Item 42b} = \frac{\text{Item 38a} \times \text{Item 39} \times 1{,}000{,}000}{\text{Item 36b} \times 62.4} = \text{PPM by weight}$$

43. If elevation-capacity curves are developed, select the appropriate intervals in feet below and above the crest. Give the percentage of the total sediment deposits located within each depth designation (elevation zone). For example:

(depth range)	122-100	100-85	85-70	70-60	60-50	50-40	40-30
(% of sed't)	4	5	6	7	7	9	10

30-20	20-10	10-Crest	Crest-+15	+15-+25
12	15	18	5	2

44. The sediment distribution in percent according to distance from the dam. The reach designation is the percent of the distance from the dam to the maximum upstream extent of the spillway-crest contour at the elevation given in Item 9 at the date of the beginning of storage. Thus, 20 percent would be 1/5 of the distance from the dam to the head of backwater at the original crest stage.

45. List the maximum and minimum water elevations and the total inflow in acre-feet for each water year of record.

46. Give data from the elevation-capacity curve for the latest survey shown on Item 26. Be sure to label each survey date on the form. If space permits, give data from the elevation-capacity curve for the original survey.

47. List here all published and unpublished reports on sedimentation surveys of this reservoir. All footnote explanations are to be shown in this space. Also note and give any pertinent data, including dates of abnormal operational occurrences, such as reservoir evacuation; sluicing out sediment; releasing density currents; extreme floods and droughts; changes in spillway-crest elevation; use of flash boards; and the installation of upstream control structures. Briefly describe the sediment and any available textural analyses. If needed, use continuation sheets.

48. Give the department, agency, and division, branch, or field office responsible for each survey.

49. Give the agency and department reporting the data.

50. Give the date this form was prepared by the office listed in Item 49.

RESERVOIR SEDIMENT DATA SUMMARY

SCS-34 Rev. 6-66

Six Mile Creek, Site No. 3
NAME OF RESERVOIR

U. S. DEPARTM
SOIL CO

23-
DATA SH

DAM

1. OWNER Enlo Conserv. District	2. STREAM Six Mile Creek	3. STATE New
4. SEC. 25 TWP. 2N RANGE 4W	5. NEAREST P.O. 2 mi. E of Nebo	6. COUNTY C
7. LAT. 37° 17'24"N LONG. 87° 34' 15"W	8. TOP OF DAM ELEVATION 131.0	9. SPILLWAY CRES

RESERVOIR

10. STORAGE ALLOCATION	11. ELEVATION TOP OF POOL	12. ORIGINAL SURFACE AREA, ACRES	13. ORIGINAL CAPACITY, ACRE-FEET	14. GROSS STORAGE ACRE-FEET
a. FLOOD CONTROL	123.0	198.0	2091.9	3584.9
b. MULTIPLE USE				
c. POWER				
d. WATER SUPPLY	111.0	124.8	1002.0	1493.0
e. IRRIGATION				
f. CONSERVATION				
g. INACTIVE 1/	97.0	60.2	491.0	491.0

17. LENGTH OF RESERVOIR 1.34 MILES — AV. WIDTH OF RESERVOIR 0.23

WATERSHED

18. TOTAL DRAINAGE AREA 10.14 SQ. MI.		22. MEAN ANNUAL PRECIPITATION	25.13
19. NET SEDIMENT CONTRIBUTING AREA 9.83 SQ. MI.		23. MEAN ANNUAL RUNOFF	1.6
20. LENGTH 5.17 MILES	AV. WIDTH 1.96 MILES	24. MEAN ANNUAL RUNOFF	865
21. MAX. ELEV. 398.0	MIN. ELEV. 76.0	25. ANNUAL TEMP: MEAN 58°F	RANGE

SURVEY DATA

26. DATE OF SURVEY	27. PERIOD YEARS	28. ACCL. YEARS	29. TYPE OF SURVEY	30. NO. OF RANGES OR CONTOUR INT.	31. SURFACE AREA, ACRES	32. CAPACITY, ACRE-FEET
4-18-48	-	-		-	60.2 1/ 198.0 2/	491.0 1/ 3584.9 2/
6-23-64	16.18	16.18	Range - Contour(D)	21 R 2 CI	50.3 1/ 198.0 2/	293.2 1/ 3322.4 2/

26. DATE OF SURVEY	34. PERIOD ANNUAL PRECIPITATION	35. PERIOD WATER INFLOW, ACRE-FEET a. MEAN ANNUAL	b. MAX. ANNUAL	c. PERIOD TOTAL	36. WATER INFL a. MEAN ANNUA
6-23-64	24.81	860	1033	13,930	860

26. DATE OF SURVEY	37. PERIOD CAPACITY LOSS, ACRE-FEET a. PERIOD TOTAL	b. AV. ANNUAL	c. PER SQ. MI. YEAR	38. TOTAL SED. DEPOSITS TO a. TOTAL TO DATE	b. AV. ANNUAL
6-23-64	197.80 1/ 262.44 2/	12.22 1/ 16.22 2/	1.24 1/ 1.65 2/	197.80 1/ 262.44 2/	12.22 1/ 16.22 2/

26. DATE OF SURVEY	39. AV. DRY WGT., LBS. PER CU. FT.	40. SED. DEP., TONS PER SQ. MI.-YR. a. PERIOD	b. TOTAL TO DATE	41. STORAGE LOSS, PCT. a. AV. ANN.	b. TOT. TO DATE	42. S a. PE
6-23-64	67.4(8)	1820 1/ 2422 2/	1820 1/ 2422 2/	2.48 1/ 0.45 2/	40.28 1/ 7.32 2/	20,3

Incl 3

Sand Original and one carbon
camera ready

26. DATE OF SURVEY	43. DEPTH DESIGNATION RANGE IN FEET BELOW, AND ABOVE, CREST ELEVATION											
	123-120	120-116	116-112	112-108	108-104	104-100	100-97	97-96	96-92	92-88	88-84	84-76
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION											
6-23-64				1	6	19	19	4	10	12	25	4

26. DATE OF SURVEY	44. REACH DESIGNATION PERCENT OF TOTAL ORIGINAL LENGTH OF RESERVOIR													
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-105	-110	-115	-120	-125
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN REACH DESIGNATION														
	2	17	19	14	17	10	9	7	10	5					

45. RANGE IN RESERVOIR OPERATION

WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, AC.-FT.	WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, AC.-FT.
1949	123	111	1011	1957	115	83	694
50	120	113	863	58	117	92	912
51	118	112	996	59	119	96	892
52	123	111	1024	60	123	112	1033
53	123	108	989	61	123	111	943
54	119	106	1002	62	119	109	862
55	114	97	868	63	123	109	834
56	117	84	623				

46. ELEVATION-AREA-CAPACITY DATA

ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY
Original	Capacity	- 1948	96	58.0	442.3	112	127.4	1587.0
123	198.0	3584.9	92	45.7	330.0	108	104.5	1125.0
120	178.4	2832.0	88	32.1	265.7	104	83.4	750.9
116	151.8	2394.2	84	21.3	170.0	100	62.1	461.6
112	128.9	1679.0	80	11.7	73.0	97	50.3	293.2
108	109.0	1228.3	1964 Capacity			96	43.1	247.0
104	94.2	931.9	123	198.0	3322.4	92	26.4	109.6
100	75.3	658.0	120	167.5	2774.8	88	17.2	23.2
97	60.2	491.0	116	150.5	2140.8	84	1.27	0.0

47. REMARKS AND REFERENCES

1/ Sediment pool only

2/ Total reservoir below crest elevation (123.0')

Land Use in Watershed: 21 percent Woodland; 47 percent Pasture; 18 percent Cropland; 6 percent Idle; 8 percent Residential.

Geology: 25 percent Chaco shale; 18 percent Thomas ls.; 57 percent Orville ss.

48. AGENCY MAKING SURVEY: New State Watershed Planning Party, Soil Conservation Service

49. AGENCY SUPPLYING DATA: Soil Conservation Service

50. DATE: Sept. 3, 1966

RESERVOIR SEDIMENT DATA SUMMARY

SCS-34 Rev. 6-66

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NAME OF RESERVOIR

DATA SHEET NO.

DAM

1. OWNER	2. STREAM	3. STATE
4. SEC. TWP. RANGE	5. NEAREST P. O.	6. COUNTY
7. LAT. ° ' " LONG. ° ' "	8. TOP OF DAM ELEVATION	9. SPILLWAY CREST ELEV.

RESERVOIR

10. STORAGE ALLOCATION	11. ELEVATION TOP OF POOL	12. ORIGINAL SURFACE AREA, ACRES	13. ORIGINAL CAPACITY, ACRE-FEET	14. GROSS STORAGE, ACRE-FEET	15. DATE STORAGE BEGAN
a. FLOOD CONTROL					
b. MULTIPLE USE					
c. POWER					16. DATE NORMAL OPER. BEGAN
d. WATER SUPPLY					
e. IRRIGATION					
f. CONSERVATION					
g. INACTIVE					

17. LENGTH OF RESERVOIR	MILES	AV. WIDTH OF RESERVOIR	MILES

WATERSHED

18. TOTAL DRAINAGE AREA	SQ. MI.	22. MEAN ANNUAL PRECIPITATION	INCHES
19. NET SEDIMENT CONTRIBUTING AREA	SQ. MI.	23. MEAN ANNUAL RUNOFF	INCHES
20. LENGTH MILES	AV. WIDTH MILES	24. MEAN ANNUAL RUNOFF	AC.-F T.
21. MAX. ELEV.	MIN. ELEV.	25. ANNUAL TEMP : MEAN RANGE	

SURVEY DATA

26. DATE OF SURVEY	27. PERIOD YEARS	28. ACCL. YEARS	29. TYPE OF SURVEY	30. NO. OF RANGES OR CONTOUR INT.	31. SURFACE AREA, ACRES	32. CAPACITY, ACRE-FEET	33. C/I. RATIO, AC.-FT. PER AC.-FT.

26. DATE OF SURVEY	34. PERIOD ANNUAL PRECIPITATION	35. PERIOD WATER INFLOW, ACRE-FEET			36. WATER INFL. TO DATE, AC.-FT.	
		a. MEAN ANNUAL	b. MAX. ANNUAL	c. PERIOD TOTAL	a. MEAN ANNUAL	b. TOTAL TO DATE

26. DATE OF SURVEY	37. PERIOD CAPACITY LOSS, ACRE-FEET			38. TOTAL SED. DEPOSITS TO DATE, ACRE-FEET		
	a. PERIOD TOTAL	b. AV. ANNUAL	c. PER SQ. MI.-YEAR	a. TOTAL TO DATE	b. AV. ANNUAL	c. PER SQ. MI.-YEAR

26. DATE OF SURVEY	39. AV. DRY WGT., LBS. PER CU. FT.	40. SED. DEP., TONS PER SQ. MI.-YR.		41. STORAGE LOSS, PCT.		42. SED INFLOW, PPM	
		a. PERIOD	b. TOTAL TO DATE	a. AV. ANN.	b. TOT. TO DATE	a. PERIOD	b. TOT. TO DATE

26. DATE OF SURVEY	43. DEPTH DESIGNATION RANGE IN FEET BELOW, AND ABOVE, CREST ELEVATION											
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION											

26. DATE OF SURVEY	44. REACH DESIGNATION PERCENT OF TOTAL ORIGINAL LENGTH OF RESERVOIR													
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-105	-110	-115	-120	-125
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN REACH DESIGNATION														

45. RANGE IN RESERVOIR OPERATION

WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, AC.-FT.	WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, AC.-FT.

46. ELEVATION-AREA-CAPACITY DATA

ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY

47. REMARKS AND REFERENCES

48 AGENCY MAKING SURVEY

49 AGENCY SUPPLYING DATA

50. DATE _____

RESERVOIR SEDIMENT
DATA SUMMARY

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

W. Kerr Scott Reservoir
NAME OF RESERVOIR

DATA SHEET NO.

DAM

1. OWNER Dept. of Army, C of E	2. STREAM Yadkin	3. STATE North Carolina
4. SEC. TWP RANGE	5. NEAREST P O Wilkesboro, NC	6. COUNTY Wilkes
7. LAT 36° 9' N " LONG 81° 14' W "	8. TOP OF DAM ELEVATION 1,107.5	9. SPILLWAY CREST ELEV 1,075.0

RESERVOIR

10. STORAGE ALLOCATION	11. ELEVATION TOP OF POOL	12. ORIGINAL SURFACE AREA, ACRES	13. ORIGINAL CAPACITY, ACRE-FEET	14. GROSS STORAGE, ACRE-FEET	15. DATE STORAGE BEGAN
a. FLOOD CONTROL	1,075.0	4,000	112,600	154,000	Aug. 22, 62
b. MULTIPLE USE					
c. POWER					16. DATE NORMAL OPER BEGAN
d. WATER SUPPLY	1,030.0	1,475	33,100	41,400	
e. IRRIGATION					
f. CONSERVATION					
g. INACTIVE	1,000.0	675	8,300	8,300	Jan. 19, 63

WATERSHED

17. LENGTH OF RESERVOIR 4.73 MILES		AV WIDTH OF RESERVOIR 0.49 MILES	
18. TOTAL DRAINAGE AREA 348 SQ MI		22. MEAN ANNUAL PRECIPITATION 52.84 (41) INCHES	
19. NET SEDIMENT CONTRIBUTING AREA 348 SQ. MI.		23. MEAN ANNUAL RUNOFF 22.22 (57) INCHES	
20. LENGTH 38.5 MILES	AV. WIDTH 9.04 MILES	24. MEAN ANNUAL RUNOFF 412,482 AC.-FT.	
21. MAX. ELEV. 4,100	MIN. ELEV. 965.0	25. ANNUAL TEMP MEAN 55.8	RANGE -5 to 98 (16)

SURVEY DATA

26. DATE OF SURVEY	27. PERIOD YEARS	28. ACCL YEARS	29. TYPE OF SURVEY	30. NO. OF RANGES OR CONTOUR INT.	31. SURFACE AREA, ACRES	32. CAPACITY, ACRE-FEET	33. C I RATIO, AC FT PER AC FT.
Aug. 1962	-	-	Range	8 Ranges	4,000	154,000	0.40
May 1971	8.8	8.8	Range (D)	20 Ranges	4,000	153,826	0.40
May 1978	7.0	15.8	Range (D)	20 Ranges	4,000	151,700	0.39

26. DATE OF SURVEY	34. PERIOD ANNUAL PRECIPITATION	35. PERIOD WATER INFLOW, ACRE-FEET			36. WATER INFL TO DATE, AC.-FT.	
		a. MEAN ANNUAL	b. MAX. ANNUAL	c. PERIOD TOTAL	a. MEAN ANNUAL	b. TOTAL TO DATE
Aug. 1962	-	-	-	-	-	-
May 1971	51.5	400,326	496,973	3,502,854	400,326	3,502,854
May 1978	60.78	566,505	694,033	3,965,535	472,683	7,468,389

26. DATE OF SURVEY	37. PERIOD CAPACITY LOSS, ACRE-FEET			38. TOTAL SED DEPOSITS TO DATE, ACRE-FEET		
	a. PERIOD TOTAL	b. AV ANNUAL	c. PER SQ MI YEAR	a. TOTAL TO DATE	b. AV ANNUAL	c. PER SQ MI YEAR
Aug. 1962	-	-	-	-	-	-
May 1971	174	19.8	.056	174	19.8	.056
May 1978	1191	170.1	.489	1331	84.2	.242

26. DATE OF SURVEY	39. AV DRY WGT, LBS PER CU FT	40. SED DEP, TONS PER SQ MI-YR		41. STORAGE LOSS, PCT		42. SED INFLOW, PPM	
		a. PERIOD	b. TOTAL TO DATE	a. AV ANN	b. TOT TO DATE	a. PERIOD	b. TOT TO DATE
Aug. 1962	-	--	-	-	-	-	-
May 1971	No sediment samples		taken	.01	.11		
May 1978				.05	.86		

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NOV 66

PREVIOUS EDITIONS ARE OBSOLETE.

26. DATE OF SURVEY	43. DEPTH DESIGNATION RANGE IN FEET BELOW, AND ABOVE, CREST ELEVATION												
	Inactive Pool		Water Supply Pool			Flood Control Pool							
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION												
Aug. 1962	-	-	-	-		-	-						
May 1971	58.0%		58.6%			-16.6%							
May 1978	85.3%		42.7%			-28.0%							

26. DATE OF SURVEY	44. REACH DESIGNATION PERCENT OF TOTAL ORIGINAL LENGTH OF RESERVOIR													
	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	-105	-110	-115	-120	-125
	PERCENT OF TOTAL SEDIMENT LOCATED WITHIN REACH DESIGNATION														

45. RANGE IN RESERVOIR OPERATION

WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, AC.-FT.	WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, AC.-FT
1962 Sep	1,024.8	975.8	27,093	1973	1,044.20	1,025.80	654,455
1963	1,031.1	1,024.8	369,026	1974	1,041.40	1,029.30	611,470
1964	1,032.5	1,026.7	327,642	1975	1,047.30	1,029.10	617,477
1965	1,039.4	1,026.1	496,973	1976	1,043.40	1,023.30	465,284
1966	1,044.0	1,029.7	380,647	1977	1,044.35	1,021.10	473,641
1967	1,031.3	1,029.8	334,730	1978	1,061.20	1,027.00	482,176
1968	1,031.6	1,029.8	440,321	Oct-May			
1969	1,037.3	1,029.4	471,693				
1970	1,060.2	1,028.5	468,121				
1971 1/	1,032.7	1,021.3	426,077				
1972	1,047.7	1,027.65	537,446				

46 ELEVATION-AREA-CAPACITY DATA

ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY
970	50	75	1050	2225	76,500			
980	125	667	1060	2775	101,700			
990	318	2,493	1070	3550	132,700			
1000	675	7,169	1075	4000	151,700			
1010	1025	15,388						
1020	1225	26,443						
1030	1475	39,701						
1040	1800	55,627						

47. REMARKS AND REFERENCES

1/ Temporary change in normal pool from elevation 1030 to 1033 beginning September 1971 until September 1973.

48. AGENCY MAKING SURVEY U. S. Army Corps of Engineers

49. AGENCY SUPPLYING DATA Charleston District

50. DATE May 1979

ACKNOWLEDGEMENT

1. The preparation of the report was administered by:

   Colonel William W. Brown, Corps of Engineers, District Engineer

   Jack J. Lesemann, Chief, Engineering Division

   Edwin W. Meredith, Chief, Project Planning Branch

   Robert F. Billue, Chief, Hydrology and Hydraulics Section

2. This report was prepared by W. Ted Hauser with the assistance of S. Dean Herndon, William H. Durdin, and John L. Sherrill.

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DEPARTMENT OF THE ARMY
CHARLESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 919
CHARLESTON, SOUTH CAROLINA 29402

SACEN-PH 31 March 1980

SUBJECT: Sedimentation Report on W. Kerr Scott Reservoir, N. C.

Division Engineer, South Atlantic
Atlanta, Georgia

INTRODUCTION

1. Authorization. This report is prepared in accordance with EM 1110-2-4000, dated 15 November 1961, and is the second in a series of reports designed to present comparative results of sedimentation investigations.

2. Purpose and scope. The purpose of this report is to make an evaluation of sedimentation problems related to the presence and operation of the W. Kerr Scott Reservoir, and determine if the accumulated volume of sediment is sufficient to warrant revising the original stage-capacity curve. This report will evaluate the monitoring program for the project and will serve as an instrument for documenting basic field data essential for this and future efforts.

PROJECT DESCRIPTION

3. Location. The project is located on the Yadkin River in northwestern North Carolina, about 160 miles northwest of Raleigh; 90 miles north of Charlotte and about 5.5 miles west of Wilkesboro. A map showing the dam and reservoir and the vicinity area is presented on Figure 1.

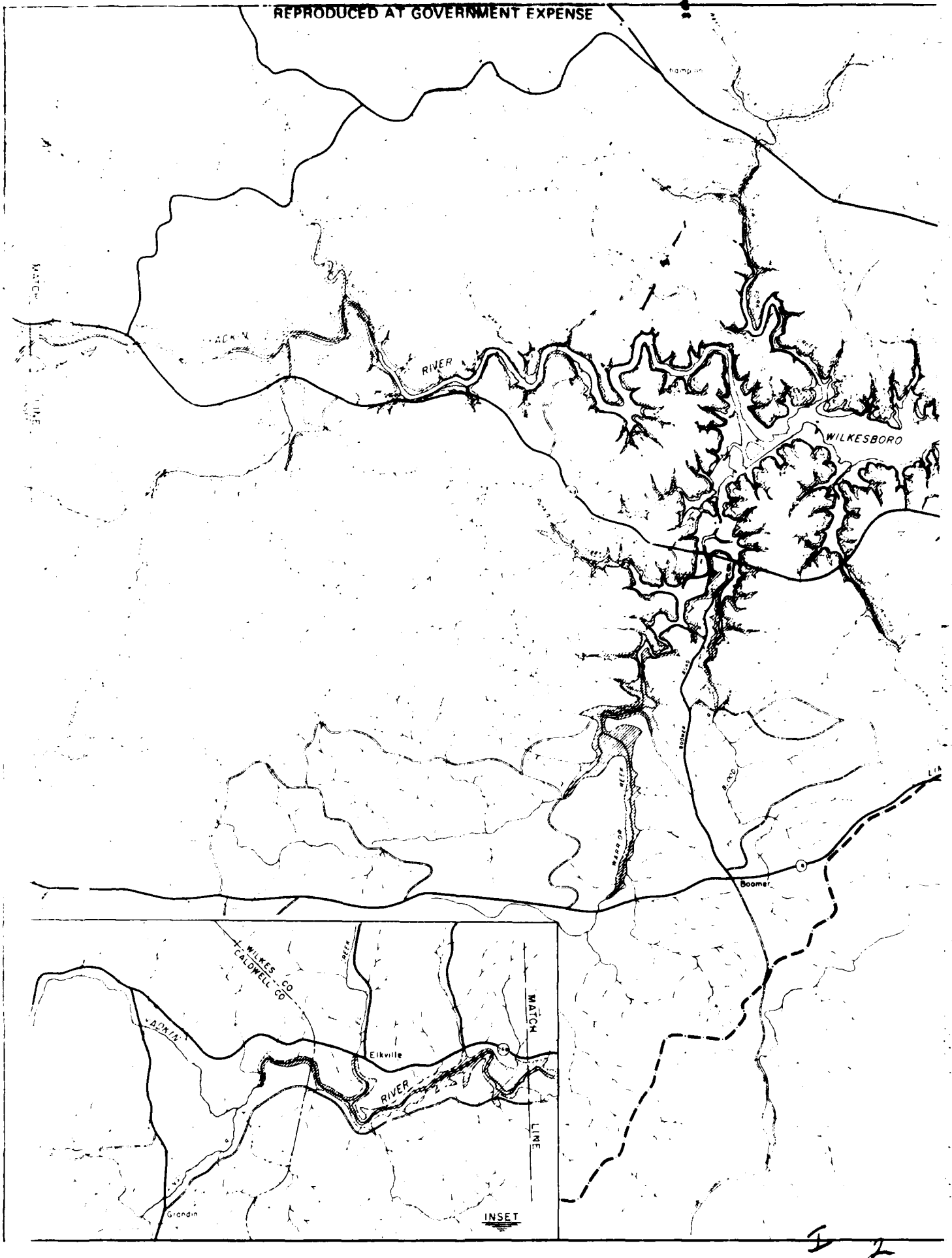
4. Purpose. The W. Kerr Scott Reservoir is a multiple-purpose project operated for flood control and water supply. The original controlled capacity at spillway elevation of 1,075 feet was 154,000 acre-feet. Allocated capacities, related pool elevations and water surface areas for original conditions are shown in Table 1.

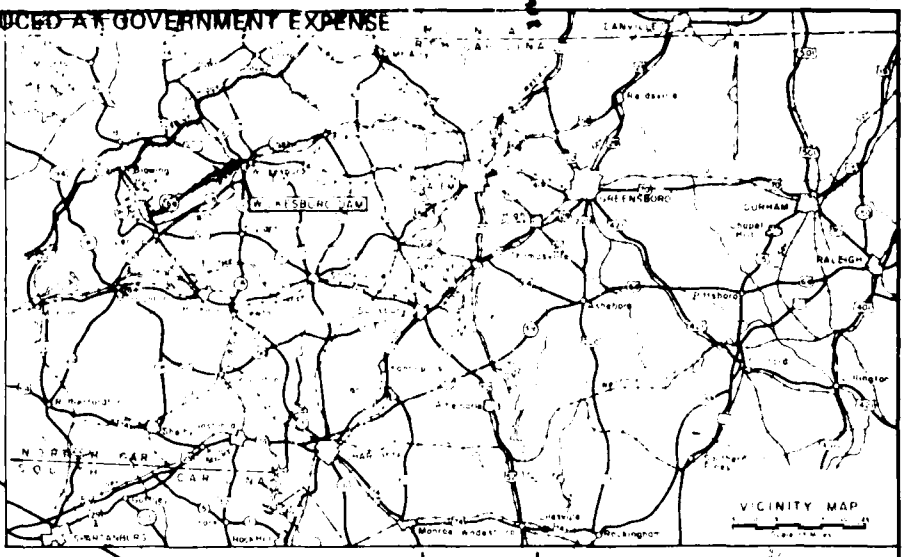
TABLE 1
ORIGINAL AREA - CAPACITY DATA

	Elevation (Ft., M.S.L.)	Surface Area (Ac.)	Total Capacity (AF)	Allocated Capacity (AF)
Top of flood control pool	1075	4000	154,000	--
Flood control storage	--	--	--	112,600
Normal pool	1030	1475	41,400	--
Water supply storage	--	--	--	33,100
Minimum operative pool	1000	675	8,300	--
Sediment and conservation storage	--	--	--	8,300

5. Watershed characteristics. The Yadkin River Basin above the dam site is a mountainous area of about 348 square miles. Its northerly boundary is the crest of the Blue Ridge Mountains and its southerly boundary the crest of the Brushy Mountains. Location of the drainage area is shown on the vicinity map on Figure 1. The entire watershed with the exception of a narrow valley between the two mountain ranges is a system of ravine-like slopes producing rapid runoff, with the result that storm runoff reaches a crest and recedes in a short time after the occurrence of a storm. The main stem of the river is characterized by relatively steep slopes in the upper reaches and flat gradients in the lower reaches. The average slope of the main stream is about six feet per mile with relatively small valley storage capacity. In contrast, tributaries of the river have steep slopes, particularly those on the north side having headwaters in the Blue Ridge Mountains. In their upper reaches, they flow through steep valleys having little or no flood plain. Stream gradients in some of these regions exceed 500 feet per mile. In their lower reaches, the gradients gradually become less steep as the tributaries flow to their confluence with the Yadkin River. Since the southside tributaries head in the Brushy Mountains, a range of much less elevation than the Blue Ridge, they have correspondingly flatter stream gradients.

6. Geology. The characteristic rock formations apparent in the upper portions of the Yadkin River Basin are of igneous origin consisting of granite, granite gneiss, schist, and quartzite that have been





SPILLWAY

DAM

RESERVOIR

YADKIN

RIVER

NORTH WILKESBORO

WILKESBORO

DRAINAGE BASIN

Morrison Falls

-LEGEND-

YADKIN RIVER, NORTH CAROLINA

W. KERR SCOTT DAM AND RESERVOIR

PROJECT LOCATION

U.S. ARMY ENGINEER DISTRICT, CHARLESTON, S.C.

SCALE AS SHOWN

SHEET 1 OF 1 SHEET FILE NO.

FIGURE 1

subjected to igneous intrusions of traprock or diabase. In general, the overlying material is composed of a deep blanket of silt and clay resulting from the oxidation in place of the granite rocks. The diabase intrusions are evident as narrow dikes or hard durable rocks that have resisted erosion and oxidation.

7. Reservoir features. The dam is a compacted earthfill structure with 1 on 3 side slopes, a top width of 28 feet, and a maximum height of 148 feet above the streambed. A heavy rock blanket of varying thickness is provided on the upstream slope. The embankment is zoned to provide a core of selected impervious material. The zones upstream and downstream of the core are constructed of random fill with the coarser material toward the exterior. A core trench to firm rock with a grout curtain is provided across the flood plain deposits. A combined foundation drainage blanket and inclined chimney drain is provided downstream of the impervious core. The plan and sections of the dam are shown on Figures 2 and 3. Pertinent data for the project are tabulated in Table 2.

8. Spillway. The emergency spillway was excavated through earth and rock in the north abutment. It is ungated and unlined with a crest length of 400 feet at elevation 1075. The training wall along the south side of the spillway is a cantilever T-wall supported on firm rock. Maximum height of exposed wall is about 17 feet. A small concrete sill forms the spillway crest.

9. Outlet works. The outlet works are located at the base of the dam parallel to the southerly boundary of the original flood plain. It consists of an approach channel, an intake structure, a concrete conduit, stilling basin, and discharge channel. A service bridge provides access from the top of the dam to the intake tower.

10. Approach channel. The gate approach channel walls are cantilever T-walls supported on rock. Height of the north wall varies from 16 to 34 feet above the base and the top of the south wall is a constant 42 feet above the base.

11. Gate structure. The gate structure is a reinforced concrete wet well tower with two gate bays. The gate openings are 6.0 by 12.25 feet and transition to a single circular conduit 12.25 feet in diameter The gate sills are at elevation 965 and the tower roof deck is at maxim pool elevation 1102.5 giving a tower height of 137.5 feet above the bas

TABLE 2
W. KERR SCOTT DAM AND RESERVOIR
PERTINENT DATA

DRAINAGE AREAS:

Yadkin River above dam	348 square miles
Wilkesboro gage (USGS 2-1120)	493 square miles

RESERVOIR DATA:

Feature	Elevation (Ft., msl)	Original Area (Acres)	Original Capacity (Ac.-Ft.)
Top of dam	1,107.5	-	-
Maximum pool, spillway design flood	1,102.5	7,170	306,000
Maximum pool, project design flood	1,083.0	4,820	190,000
Spillway crest	1,075.0	4,000	154,000
Normal pool	1,030.0	1,475	41,400
Minimum pool, (sediment and conservation storage)	1,000.0	675	8,300

EMBANKMENT:

Type	Compacted earthfill
Height (maximum above streambed)	148 feet
Length (crest)	1,750 feet
Width (crest)	28 feet
Freeboard	5 feet

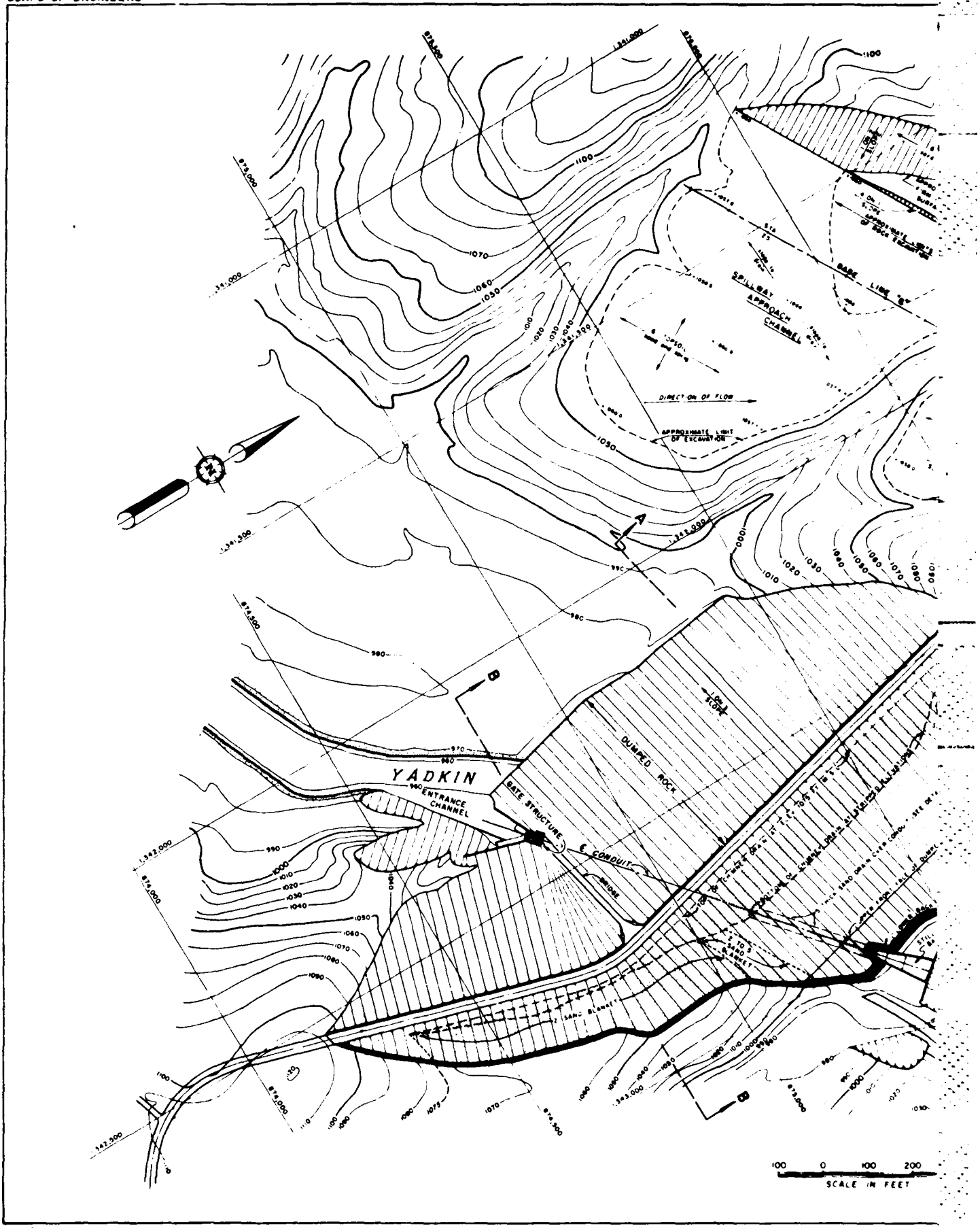
OUTLET WORKS:

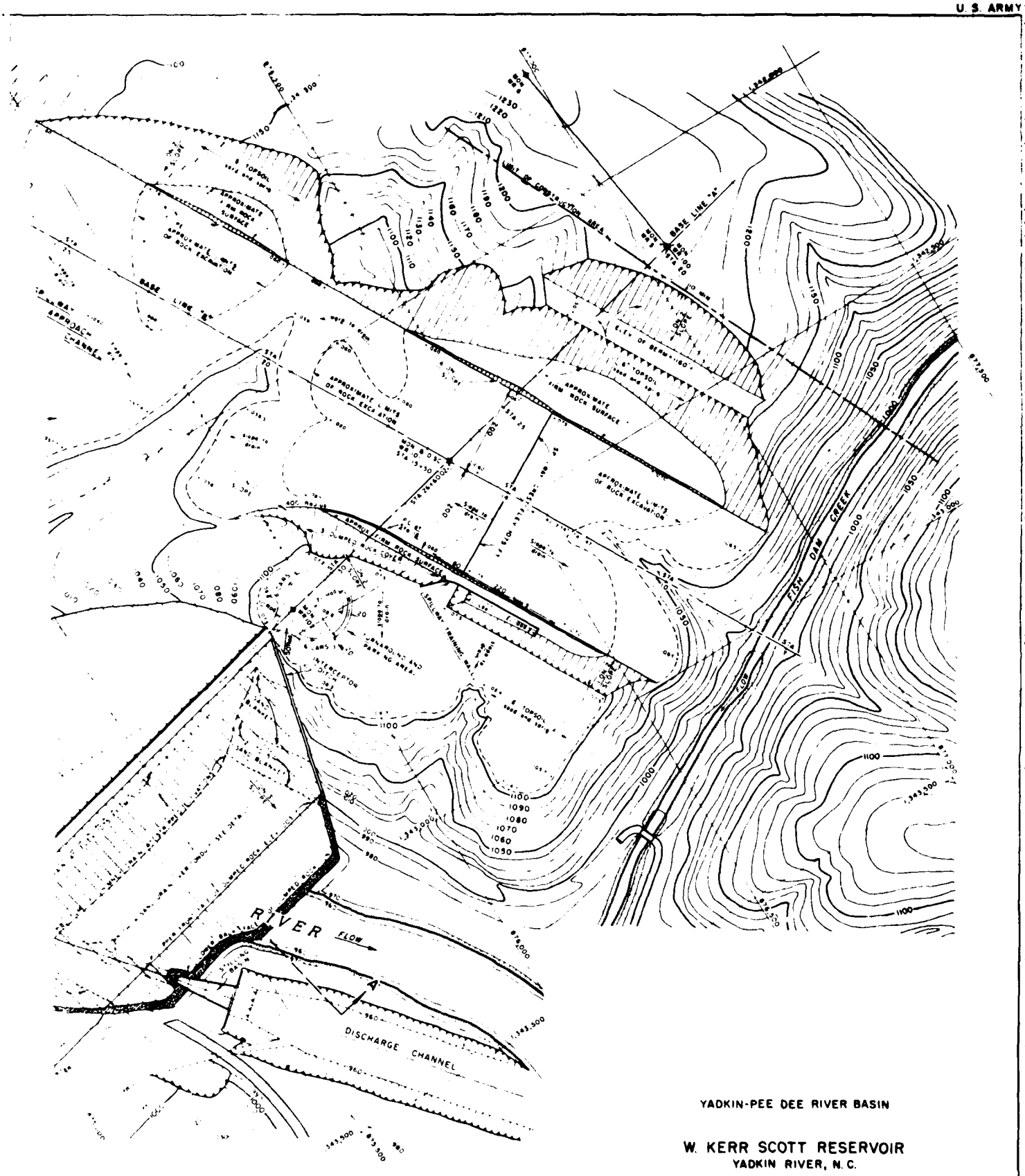
Type	Circular, reinforced concrete
Diameter	12.25 feet
Length (service gates to outlet portal)	749 feet
Invert elevation (entrance)	965.0 feet msl
Invert elevation (exit portal)	960.0 feet msl
Discharge capacity:	
Normal pool elevation	5,400 cfs
Maximum pool	6,800 cfs

SPILLWAY:

Type	Ungated, unpaved chute-type with small concrete sill crest and side-channel discharge
Location	North abutment
Crest elevation	1,075.0 feet msl
Crest length	400 feet
Capacity (maximum water surface)	176,500 cfs
Side slopes	4 vert. : 1 horiz.

CORPS OF ENGINEERS



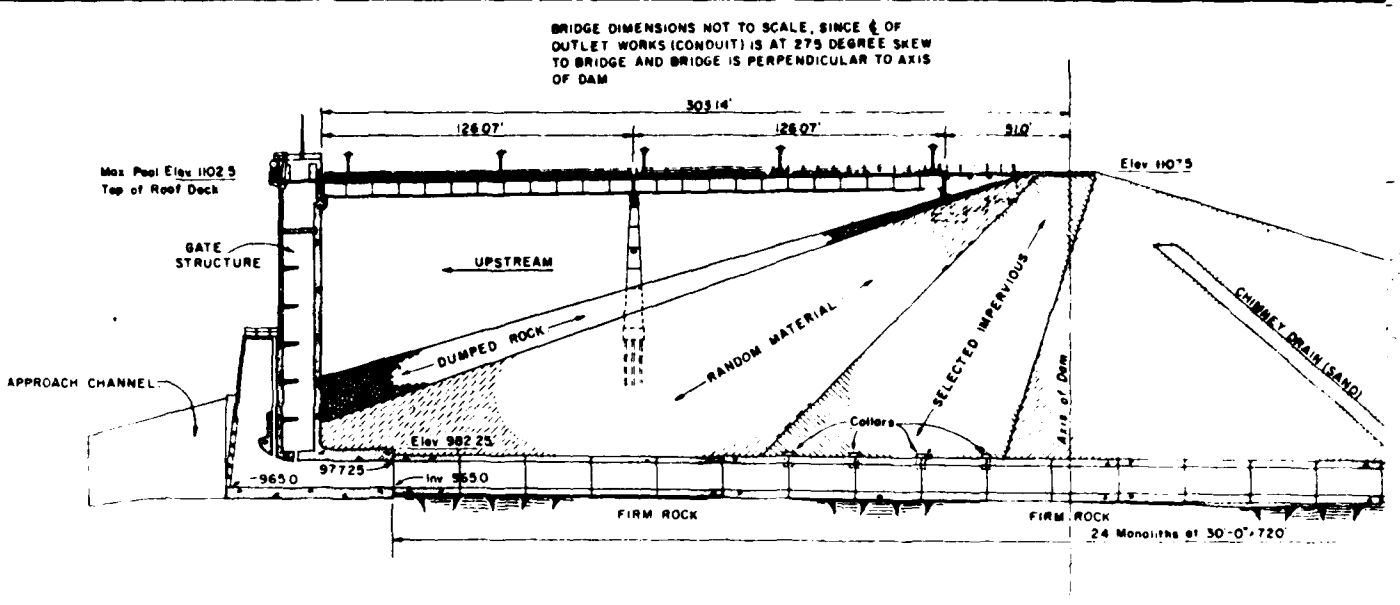


YADKIN-PEE DEE RIVER BASIN

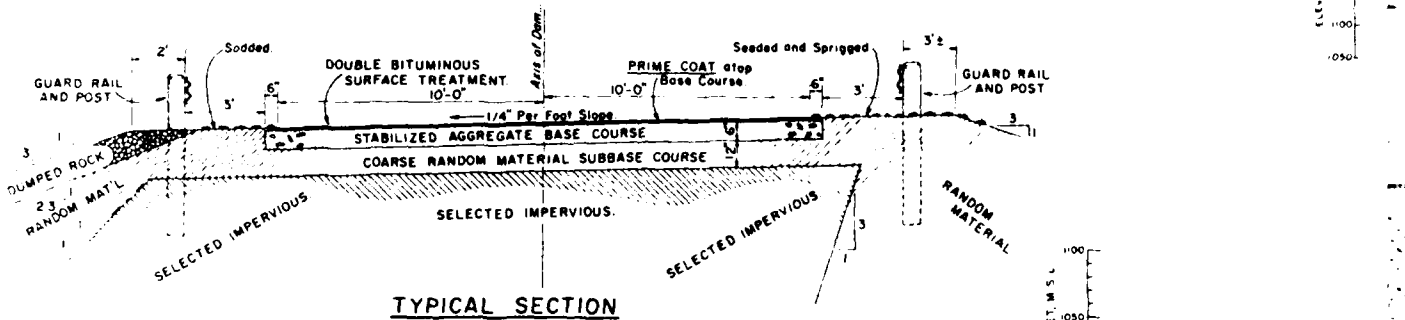
W. KERR SCOTT RESERVOIR
YADKIN RIVER, N. C.

PLAN OF DAM & SPILLWAY

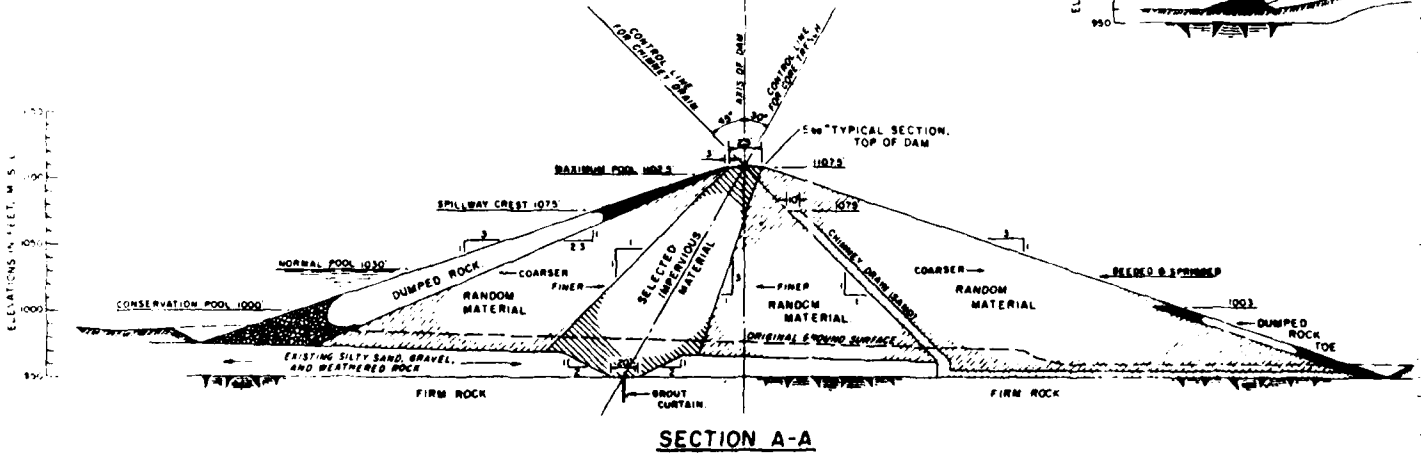
FIGURE 2



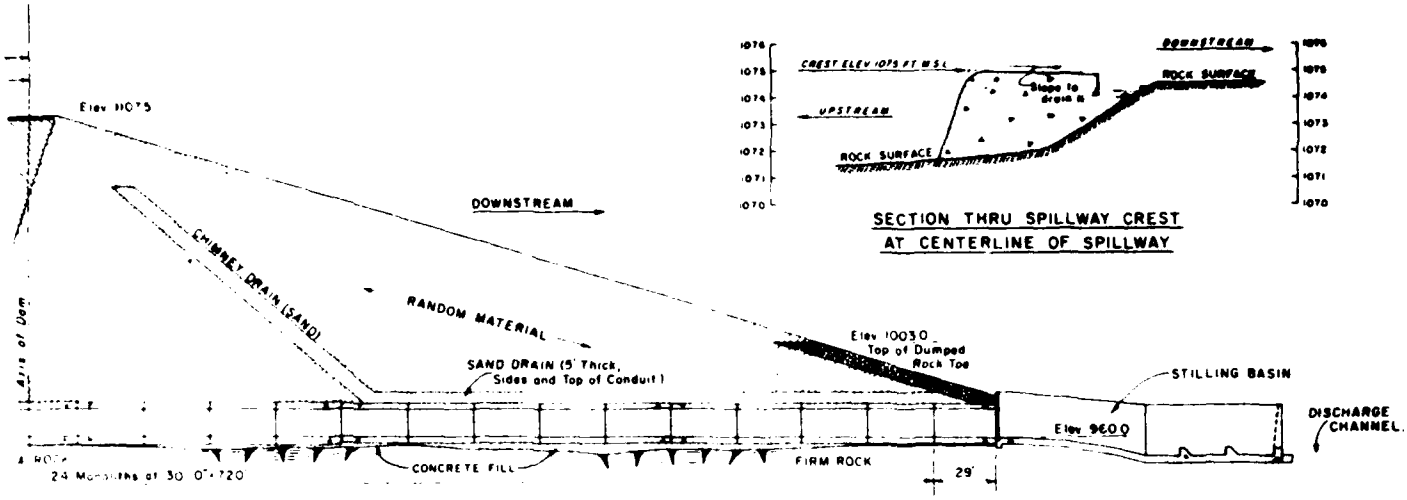
LONGITUDINAL SECTION THRU CONDUIT

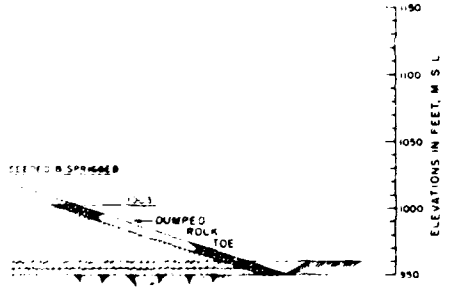


TYPICAL SECTION
TOP OF DAM



SECTION A-A





YADKIN-PEE DEE RIVER BASIN

W. KERR SCOTT RESERVOIR
YADKIN RIVER, N.C.

SECTIONS OF DAM & SPILLWAY

FIGURE 3

II

12. Conduit. The 12.25-foot diameter conduit is 749 feet long with monolith joints every 30 feet. Seepage collars are provided at the joints beneath the impervious core. The conduit rests on firm rock or on concrete fill where firm rock is below the base. Maximum height of fill above the conduit is about 129 feet at the axis of the dam.

13. Stilling basin. The chute and stilling basin is a reinforced concrete U-shaped structure with rock anchors and weep holes. It flares from a 12.25-foot width at the conduit outlet to about 54.5 feet at the end sill. The walls extend 23 feet above the basin slab in the stilling basin.

14. Tailwater characteristics. Preconstruction engineering studies revealed that the W. Kerr Scott Reservoir could be operated in an efficient manner without improving the Yadkin River below the dam. A point of control was found three miles below the dam and the channel capacity was rated at 5400 cfs. A routing of the reservoir with average inflow and the outflow limited to 5400 cfs showed that the reservoir could be drawn down from full flood control pool in about two weeks. Hence, 5400 cfs has been adopted as the maximum flood control release rate.

NETWORK OF RANGES

15. Original network. Prior to filling the reservoir, plans were formulated for sedimentation studies of W. Kerr Scott Reservoir and degradation studies of the channel below the dam. The original plan included fourteen sedimentaton ranges (1-A through 14-A) within the reservoir and three degradation ranges (1-C through 3-C) below the dam. The location of the sedimentation and degradation ranges are shown on Figure A-1, Appendix A. Of these fourteen ranges only eight (1-A through 8-A) were permanently established and surveyed before the initial filling of the reservoir. The survey method used was level and rod for vertical control and chaining for horizontal control.

16. Deficiencies. In 1971, as plans were being formulated to resurvey the eight existing ranges and to permanently establish the remaining six ranges, it was realized that additional coverage was needed in the upper portion of the reservoir for the purpose of monitoring sedimentation. It was determined that six additional ranges were needed. A request was forwarded to higher authority to add ranges 15-A through 20-B to the network as shown on Figure A-1. Verbal permission was received to proceed with their installation.

17. Revised network. The total network now consists of 20 sediment ranges upstream of the dam and three degradation ranges below the dam, as shown on Figure A-1. In 1971, all ranges were surveyed and permanent markers installed for those which had not previously been established. Permanent markers were not installed for degradation ranges, however, field notes contain sufficient data on witness points for location in the future. Terrestrial survey methods used in 1971 were identical to those used in 1962. Hydrographic surveys were made using a fathometer and a tag line.

RANGE SURVEYS

18. Results of 1971 survey. Results of the 1971 investigation were presented in a report entitled, "Report on Sedimentation, W. Kerr Scott Reservoir, Yadkin River, North Carolina, Surveys of August 1962 and March, May and June 1971" dated November 1972.

19. The 1978 resurvey. The 1978 resurvey was also a detailed range survey with all sediment and degradation ranges being surveyed as in the 1971 survey. A comparison of the results of the 1978 resurvey with previous surveys at each range is shown in Appendix A.

OCCURRENCES OF SEDIMENT

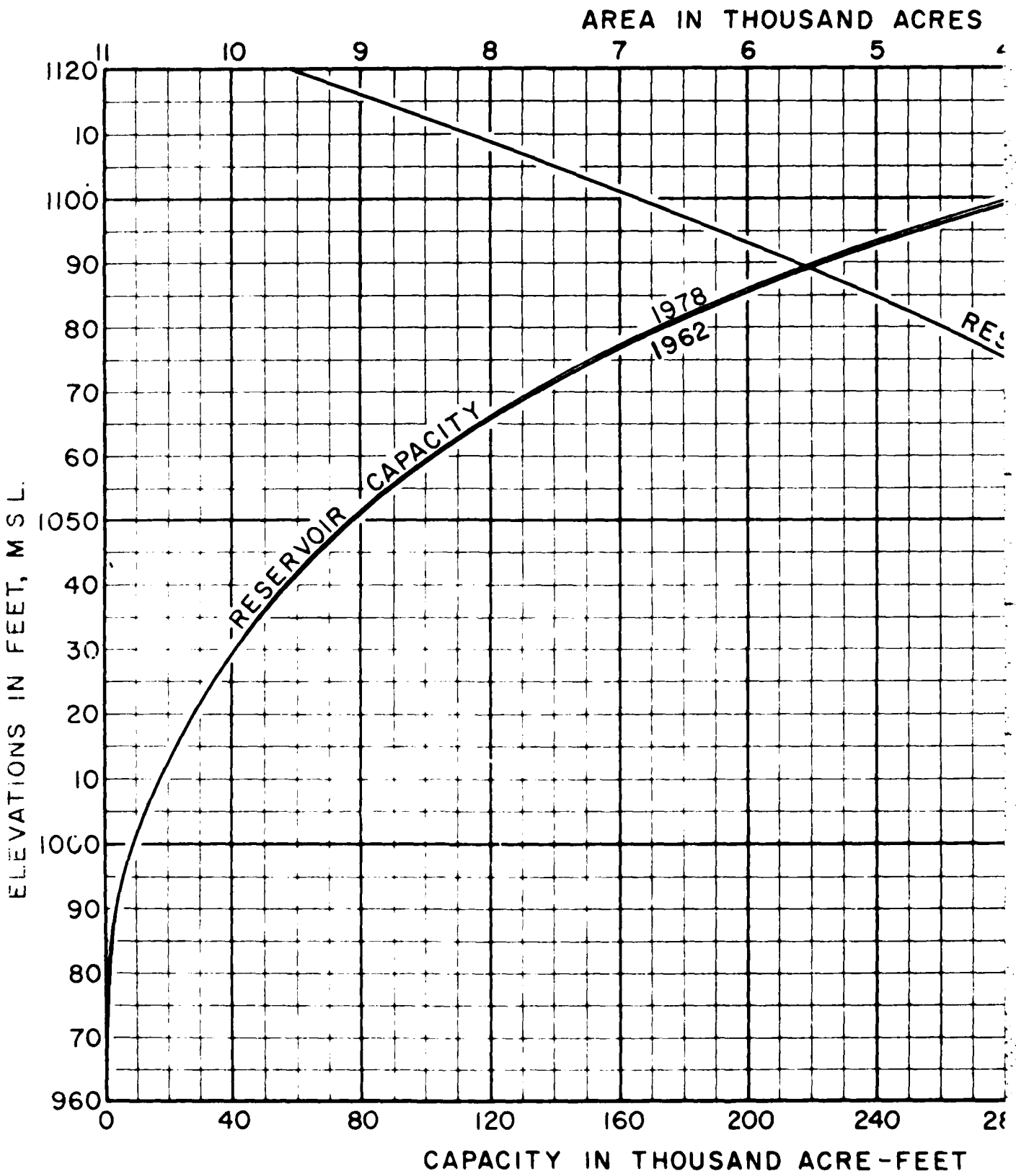
20. Computations. To facilitate computations of volumetric change, coefficients were developed after the 1971 survey which relate increments of cross-sectional area to increments of volume. Derivation of the method, tabulations of coefficients, and an explanation of their use is contained in Appendix B.

21. Volume of sediment in the reservoir. The volume of sediments deposited in W. Kerr Scott Reservoir during the 15.8 years of reservoir operation has been 1,331 acre-feet to elevation 1045.0 or an average of 84 acre-feet per year. During the period between surveys, from May 1971 to May 1978 (7.0 years), a total of 1,191 acre-feet of sediments was deposited with an increased average of 170 acre-feet per year. The change in reservoir capacity in ten-foot increments is shown in Table 3. The original and updated area-capacity curves are shown on Figure 4.

22. Distribution of sediment in the reservoir. Sediment distribution with respect to elevation was calculated to elevation 1045.0 or 15 feet above normal pool. It was anticipated that most of the sediment deposits would be found between elevations 1020 and 1040 since normal pool is 1030; however, 85.3 percent of the total sediment deposits were located below elevation 1000, while 42.7 percent were deposited between elevations 1000 and 1030. A -28.0 percent was found in the flood control pool (above elevation 1030). A comparison of reservoir profiles drawn through the

TABLE 3
W. KERR SCOTT RESERVOIR
CHANGE IN RESERVOIR CAPACITY BETWEEN SURVEYS

Range in Elevation (msl)	Capacity (ac-ft)			Change in Capacity (ac-ft)		
	Original Survey	1971 Survey	1978 Resurvey	Original-1971 Surveys	1971-1978 Surveys	Original-1978 Surveys
960 - 970	250	228	75	- 22	- 153	- 175
970 - 980	875	792	592	- 83	- 200	- 283
980 - 990	2,215	2,256	1,826	+ 41	- 430	- 389
990 - 1000	4,965	4,928	4,676	- 37	- 252	- 289
1000 - 1010	8,400	8,336	8,219	- 64	- 117	- 181
1010 - 1020	11,200	11,157	11,055	- 43	- 102	- 145
1020 - 1030	13,500	13,501	13,258	+ 1	- 243	- 242
1030 - 1040	15,600	15,628	15,926	+ 28	+ 298	+ 326
1040 - 1045	10,000	10,039	10,047	+ 39	+ 8	+ 47



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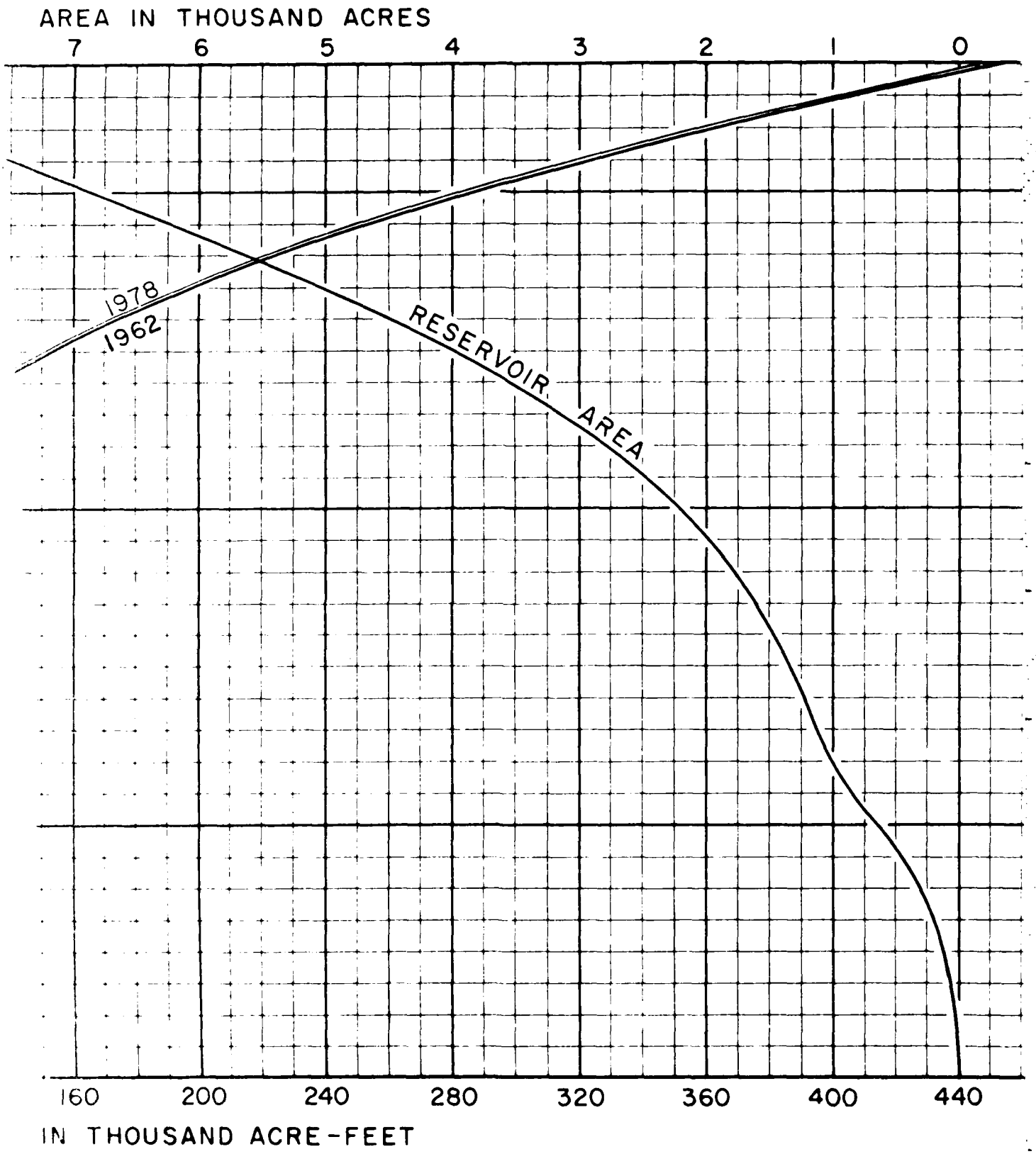

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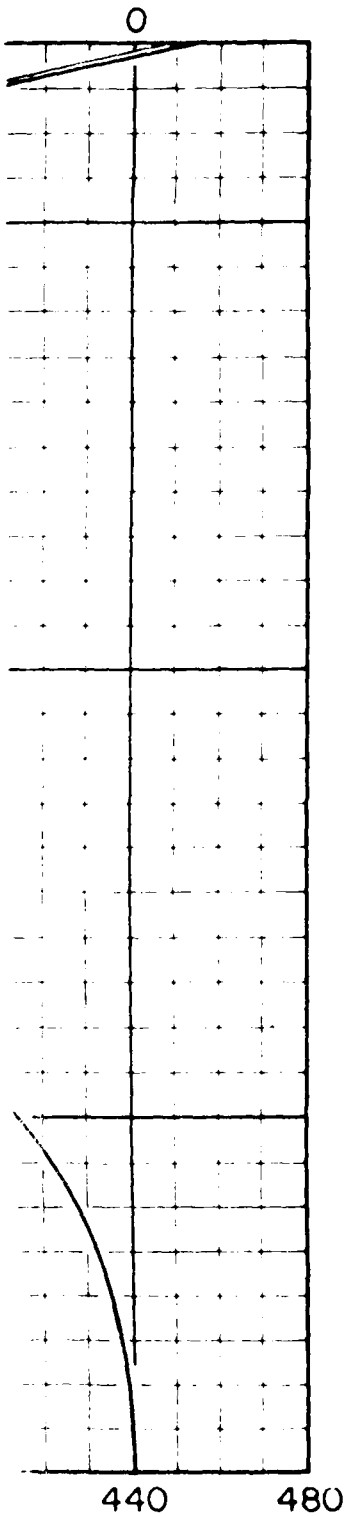
RESERVOIR AREA AND CAPACITY



POOL ELEV. (Ft-M.S.L.)	TOTAL STORAGE (Acre-Ft.)	TOTAL AREA (Acres)
1000	7,169	675
1001	7,991	700
1002	8,813	750
1003	9,635	800
1004	10,457	850
1005	11,279	875
1006	12,100	900
1007	12,922	925
1008	13,744	975
1009	14,566	998
1010	15,388	1,025
1011	16,494	1,050
1012	17,599	1,052
1013	18,704	1,098
1014	19,810	1,100
1015	20,915	1,148
1016	22,021	1,150
1017	23,126	1,175
1018	24,232	1,200
1019	25,338	1,204
1020	26,443	1,225
1021	27,769	1,250
1022	29,095	1,275
1023	30,420	1,300
1024	31,746	1,325
1025	33,072	1,350
1026	34,398	1,375
1027	35,724	1,400
1028	37,049	1,425
1029	38,375	1,450
1030	39,701	1,475
1031	41,294	1,500
1032	42,886	1,548
1033	44,479	1,575
1034	46,071	1,600
1035	47,664	1,625
1036	49,257	1,650
1037	50,849	1,700
1038	52,442	1,725
1039	54,034	1,750
1040	55,627	1,800
1041	57,636	1,825
1042	59,645	1,875
1043	61,655	1,925
1044	63,664	1,950
1045	65,674	2,000
1046	67,700	2,050
1047	69,700	2,100
1048	71,700	2,150
1049	73,900	2,175
1050	76,500	2,225
1051	78,700	2,275
1052	81,000	2,325
1053	82,900	2,375
1054	85,700	2,430
1055	88,200	2,500
1056	90,700	2,550
1057	92,700	2,600
1058	95,700	2,650
1059	98,700	2,725
1060	101,700	2,775
1061	104,700	2,850
1062	107,700	2,900
1063	110,700	3,000
1064	113,700	3,075
1065	116,700	3,150
1066	119,700	3,200
1067	122,700	3,300
1068	126,200	3,400
1069	129,700	3,475
1070	132,700	3,550
1071	136,700	3,650
1072	140,700	3,750
1073	144,300	3,825
1074	148,700	3,925
1075	151,700	4,000

YADKIN-PEE DEE RIVER BASIN

W. KERR SCOTT RESERVOIR
SEDIMENTATION RESURVEY

AREA-CAPACITY CURVE & TABLE

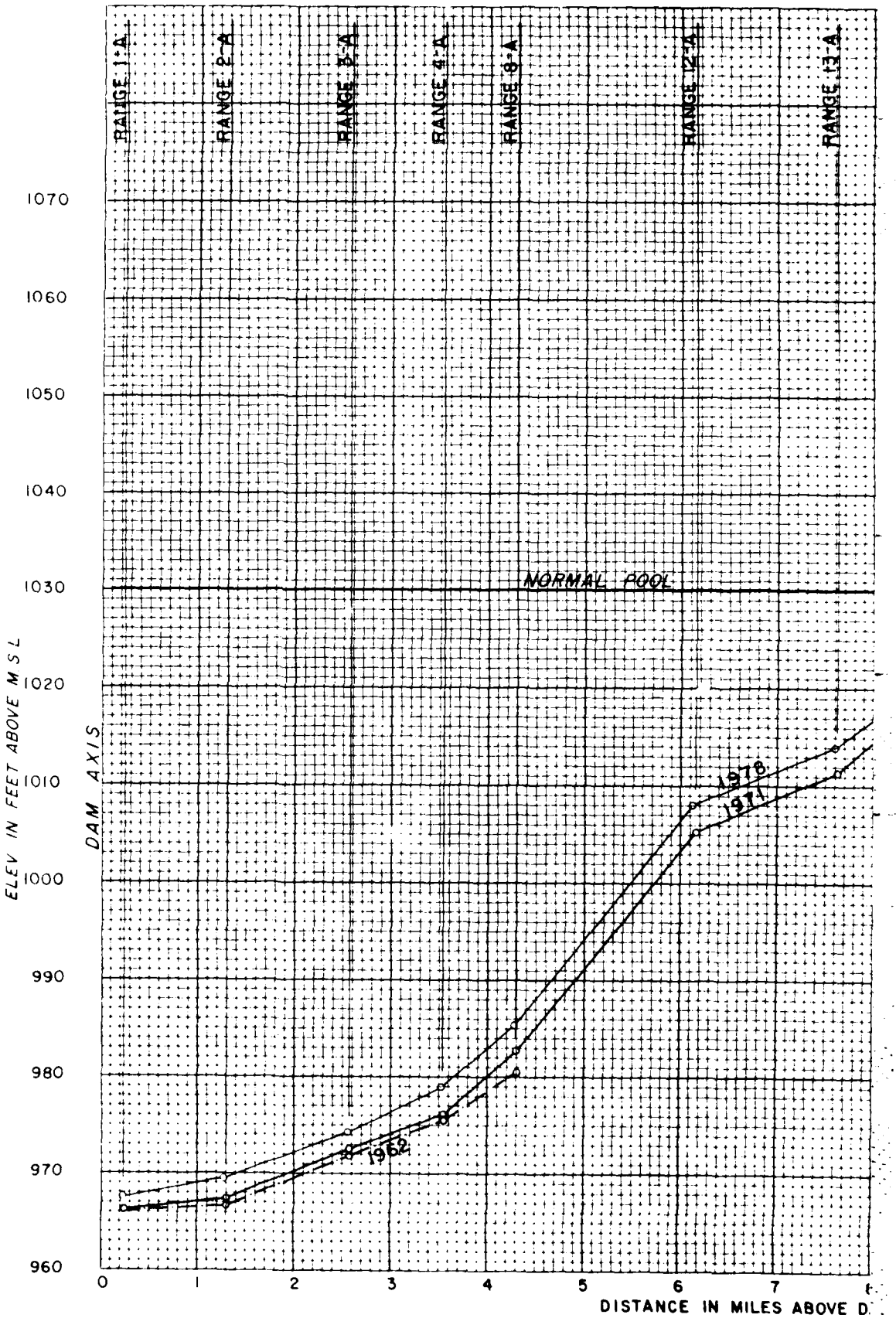
FIGURE 4

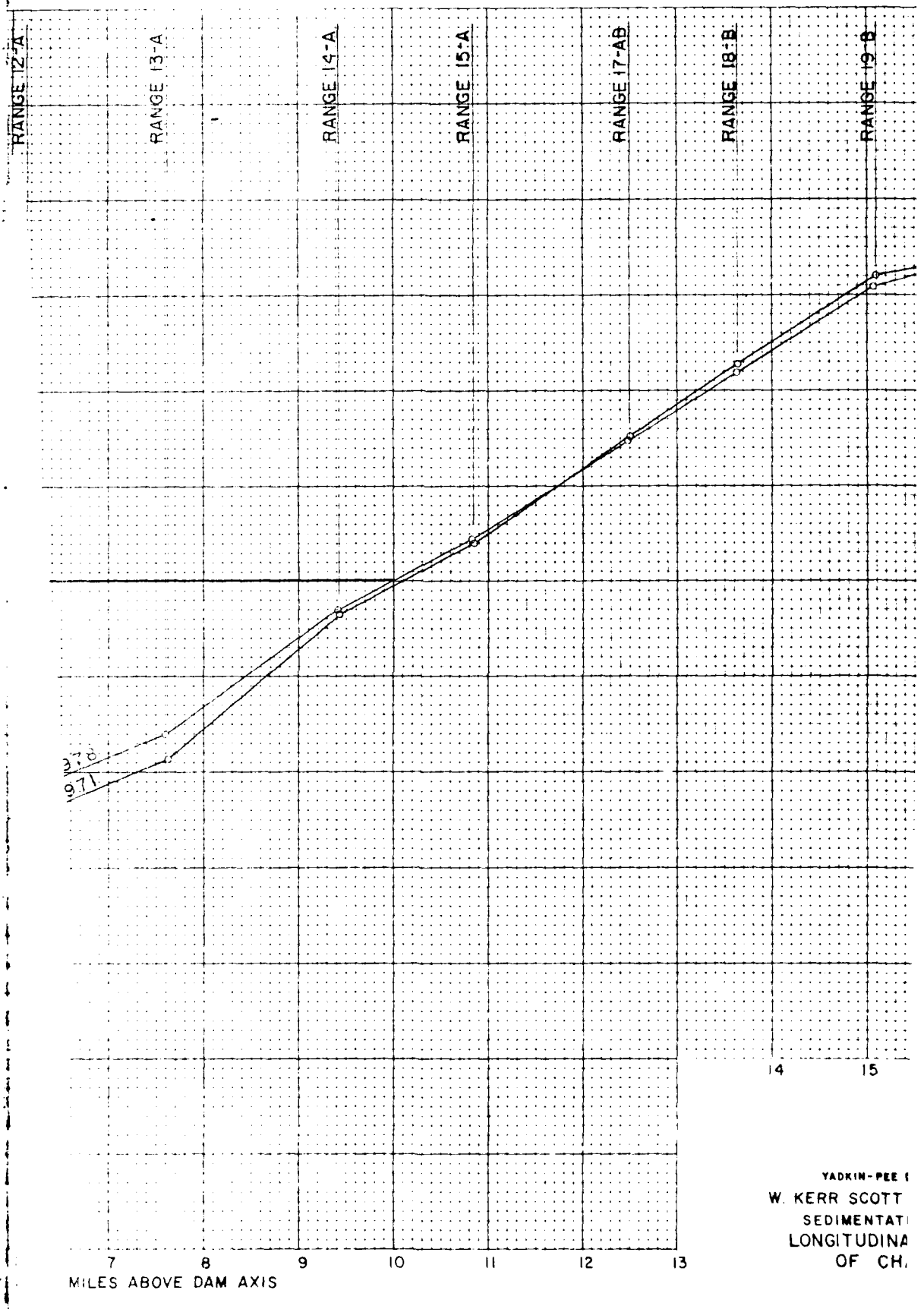
invert of each sedimentation range for each survey are shown on Figure 5. These profiles show that the sediment deposits are fairly evenly distributed below elevation 1020.

23. Grain size analysis. Taking advantage of a pool drawdown that exposed sediment deposit areas, four sediment samples were obtained on 21 November 1978. The locations from which these samples were taken are shown on Figure 6. A grain size analysis, using a hydrometer, was conducted on all samples taken. Results of these tests are shown in Table 4. Samples S-1A and S-1B were taken at the same location to show the layering of sediment present. Sample S-1A was taken below S-1B. The material contained in each of these samples (S-1A, S-1B) was classified as slightly micaceous with the lower sample containing a poorly graded sand (SP), while the upper sample contained a fine silty sand (ML). The material contained in sample S-2 was classified as a slightly micaceous fine silty sand (SM) and that contained in sample S-3, a slightly micaceous fine clayey sand (SM - SC). All samples were taken in areas where the reservoir bottom was exposed.

24. Densities. To date no density tests have been conducted to determine the amount of compaction occurring in previous sediment deposits.

25. Sediment sources. Cross-sectional plots show that there has been minor redistribution of material along the bottom of the reservoir; however, the major source of sediments is probably from farm lands and apparent lack of reforestation in the tributary areas. Due to stability of the shoreline, bank erosion has not been a major problem except along the banks where old Highway 268 cuts are exposed. Inspection of one of these cuts was made in September 1978 by members of the District staff and reservoir personnel. The following conclusions stem from this inspection as well as from consideration of previous observations. The slope, under no influence of wind, water and wave appears to be adequately stable. However, there is a predominance of sandy and granular soils which readily erode when subjected to wind and wave action. While it is concluded that the periodic fluctuation of the lake level takes its toll on the slope, the largest erosion contributor is the wind and wave action at the base of the slope. The water erodes the slope by undercutting the base and causing the soils upslope to slough downward. This condition is further aggravated by steep slopes that either cannot or will not maintain a vegetative cover. Also, the minor effects of surface runoff cause additional erosion. Once the erosion has advanced to the point of sloughing, the slope will be temporarily stabilized and the mechanism will start all over. Photographs 1, 2 & 3 of Appendix C taken on 21 November 1978 during a pool drawdown show the old Highway 268 cuts. The remaining photographs presented in Appendix C show the sediment deposits that have occurred during the 15.8 years W. Kerr Scott Reservoir has been in existence.





YADKIN-PEE
W. KERR SCOTT
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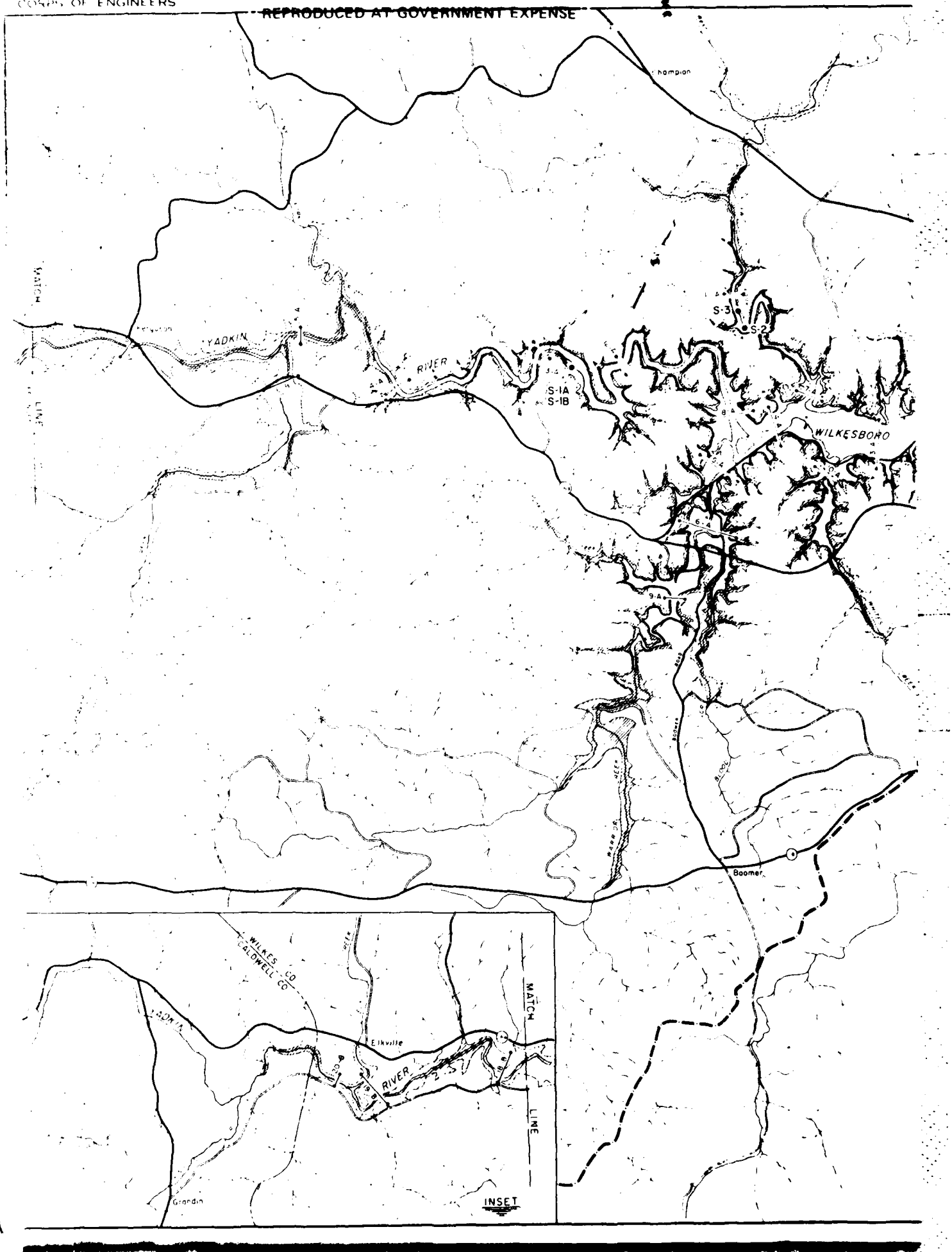
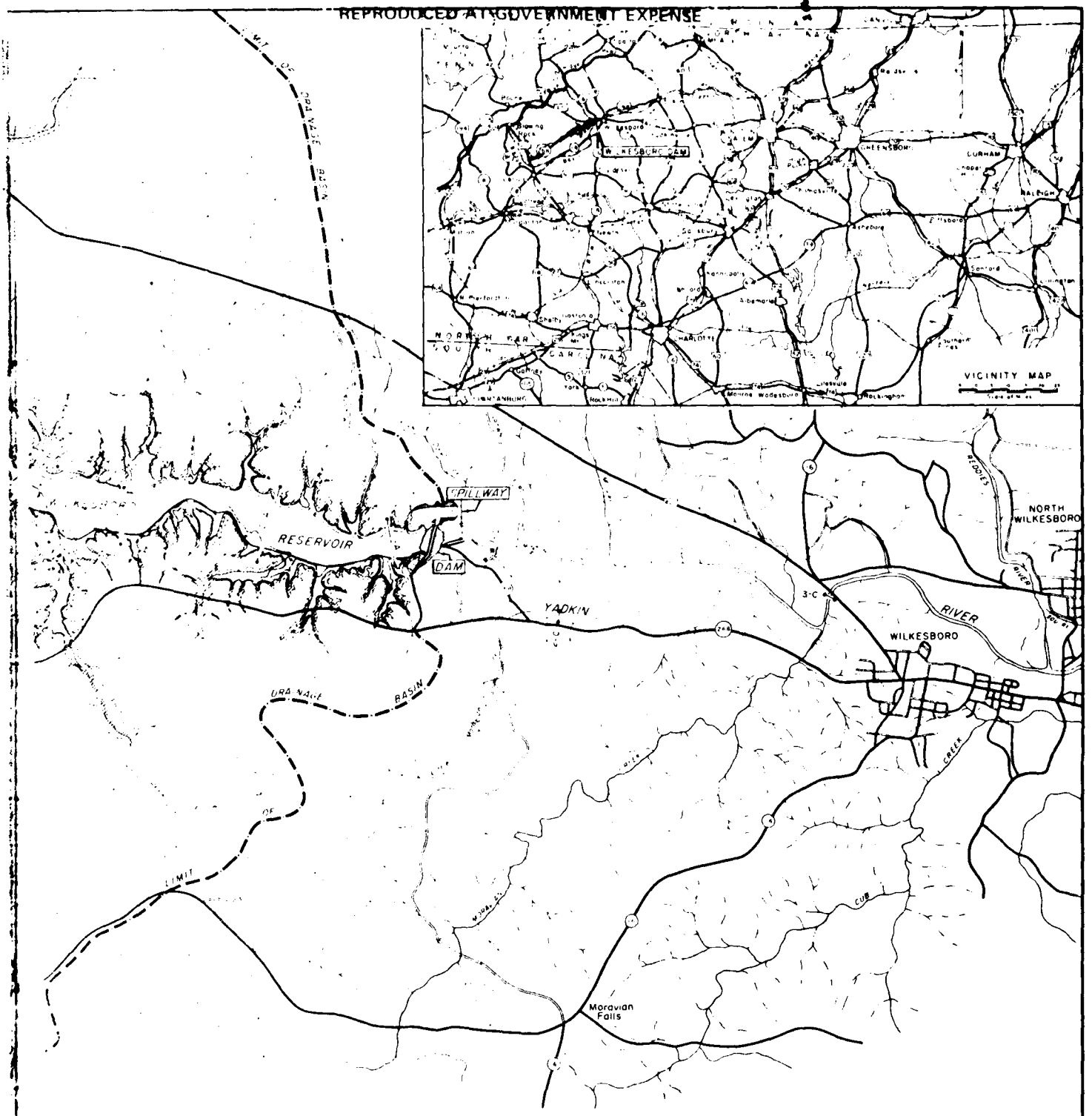




LEGEND

STATE

● S-2

REVISION	DATE	DESCRIPTION	BY	APPROVED
2	24-78	Relocated Ranges 11A THRU 14A & 17AB to Agree With Field Location	WTH	JWN
1	6-16-72	Added Ranges 15A THRU 20B	JBH	JJL

U.S ARMY ENGINEER DISTRICT, CHARLESTON
CORPS OF ENGINEERS
CHARLESTON, S C

DRAWN BY
TRACED BY
CHECKED BY
SUBMITTED BY
APPROVED

YADKIN RIVER, NORTH CAROLINA
WILKESBORO RESERVOIR

LOCATION OF SEDIMENT SAMPLES

APPROVAL RECOMMENDED DATE 18 Sept 1962

SCALE AS SHOWN
DRAWING NO 5821
SHEET 1 OF 1 SHEETS

FIGURE 6

TABLE 4

RESERVOIR SEDIMENT SAMPLE ANALYSIS

Sample Number	S-1A	S-1B	S-2	S-3
Specific Gravity	2.70	2.68	2.64	2.64
Mechanical Analysis -				
Percent of Grain Size (MM)				
2.380	100.00	100.00	100.00	100.00
2.000	99.94	99.92	99.23	99.84
.840	99.82	98.48	96.24	99.41
.420	99.18	96.11	89.83	96.62
.250	82.09	94.17	78.46	74.01
.149	25.01	91.46	61.89	33.89
.074	1.82	78.53	35.98	15.04
.051	1.00	61.39	19.17	10.52
.036	0.69	46.55	13.65	7.40
.023	0.10	31.40	9.40	5.70
.011	-	15.50	4.70	2.00
.005	-	7.90	2.00	2.00

HYDROLOGIC EVENTS OF THE EVALUATION PERIOD

26. Storm of significance. Numerous minor storms have occurred above W. Kerr Scott dam since the last sedimentation survey in 1971. Only one, that of November 1977, has major significance. Runoff stored during this event caused a rise in the flood control pool of 31.2 feet for a record peak pool stage of 1061.2 feet. Releases from the dam were not commenced until it could be assured that they would not increase downstream flooding. An account of this storm, including a history of reservoir operations, is recorded in the "Report of the Flood of 4 through 9 November 1977, Yadkin-Pee Dee River, North and South Carolina," prepared by the U. S. Army Engineer District, Charleston, South Carolina. Monthly peak reservoir stages for the 16-year project life, April 1963 to February 1979, are shown on Figures 7 and 8.

27. Normal inflow conditions. Annual runoff at the reservoir site has averaged 412,482 acre-feet during the past 57 years. The mean annual runoff for the period May 1971 to May 1978 was 566,505 acre-feet, somewhat higher than the 57-year mean. The maximum and minimum monthly inflow was 119,981 and 10,845 acre-feet in November 1977 and October 1963, respectively. Monthly inflows and outflows are given in Table 5 for the 16-year period 1963 to 1978.

28. Drought conditions. During the past seven years since the last sedimentation survey the water supply pool has been drawn down below the elevation 1024 three times. The beginning and ending period and minimum pool obtained during these drawdowns are shown in Table 6. It was noted during the November 1978 field trip that during the time of lowered pool elevations, sediment was sluffing off and being carried downstream into lower pool elevations. This can be observed in several of the photographs in Appendix C.

TABLE 6
WATER SUPPLY DRAWDOWNS

Period		
Beginning	Ending	Minimum Pool
August 1971	September 1971	1021.30
July 1976	October 1976	1023.30
July 1977	September 1977	1021.10

TABLE 5

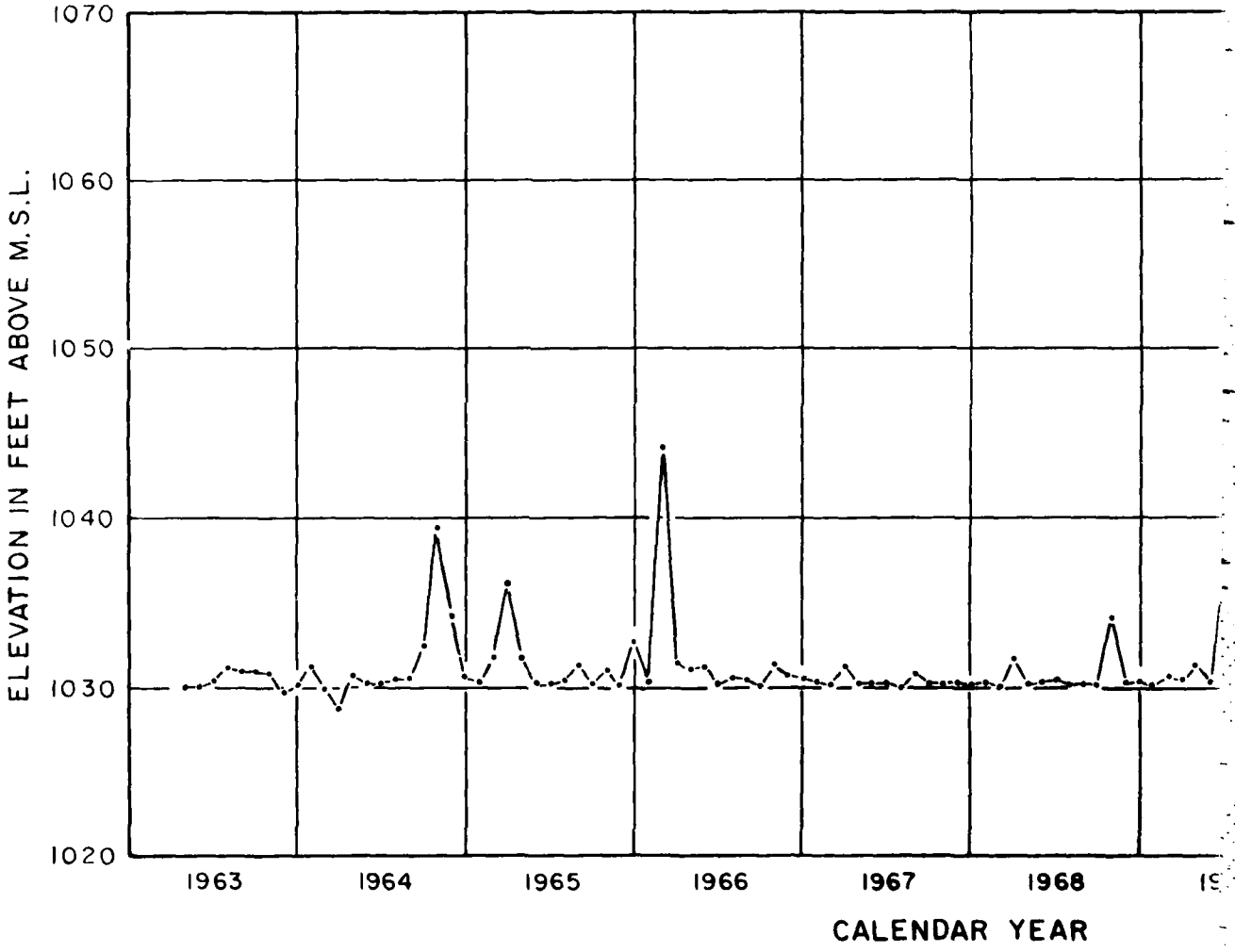
INFLOW-OUTFLOW W. KERR SCOTT RESERVOIR

CALENDAR YEAR	1963	1964	1965	1966	1967	1968	1969	1970	1971
Inflow (Acre-feet):									
January	30,351	38,199	37,055	19,844	33,558	41,537	28,754	38,579	29,669
February	22,900	45,791	52,683	78,831	28,602	28,722	40,269	37,051	50,717
March	91,106	40,809	77,517	41,371	40,891	44,010	45,099	35,921	43,863
April	31,680	44,061	51,891	31,595	22,963	34,533	49,244	41,622	33,571
May	32,074	19,704	35,563	44,474	25,771	32,841	33,405	33,126	47,771
June	23,781	18,681	28,483	23,268	21,296	29,658	67,280	24,234	28,431
July	21,404	22,548	25,525	16,789	25,878	21,370	27,105	18,274	32,722
August	15,811	25,676	33,799	22,382	25,001	18,954	36,373	98,354	27,706
September	15,310	24,965	19,382	31,864	19,580	13,213	29,760	25,906	34,727
October	10,845	61,120	33,021	26,011	20,823	34,633	30,390	33,123	52,073
November	17,218	34,610	19,168	34,584	29,932	22,903	36,448	37,317	49,886
December	19,145	39,345	18,040	30,595	40,117	25,596	48,216	26,460	47,644
Outflow (Acre-feet):									
January	20,361	37,899	37,055	20,194	33,958	41,537	28,754	39,527	29,669
February	25,250	46,541	52,683	79,281	28,602	28,722	40,269	36,901	50,717
March	91,106	40,434	77,517	41,771	40,891	43,810	45,299	35,921	43,863
April	31,080	41,911	51,891	29,595	22,963	34,533	49,244	41,622	33,371
May	32,474	22,004	35,563	46,474	25,771	33,041	33,405	33,126	47,971
June	23,981	17,181	28,633	23,718	21,296	29,958	67,280	24,534	28,581
July	19,404	22,698	25,525	16,339	25,878	21,670	27,105	19,124	32,572
August	17,611	24,726	33,649	22,382	24,801	18,954	36,373	97,204	34,556
September	13,510	21,815	19,382	31,864	19,780	13,213	29,760	26,206	26,677
October	14,495	64,870	33,021	26,011	20,823	34,483	32,190	32,823	47,733
November	16,118	34,810	19,168	34,384	29,932	22,903	36,448	38,317	50,246
December	17,895	39,345	17,846	30,395	40,117	25,596	47,416	26,460	47,974

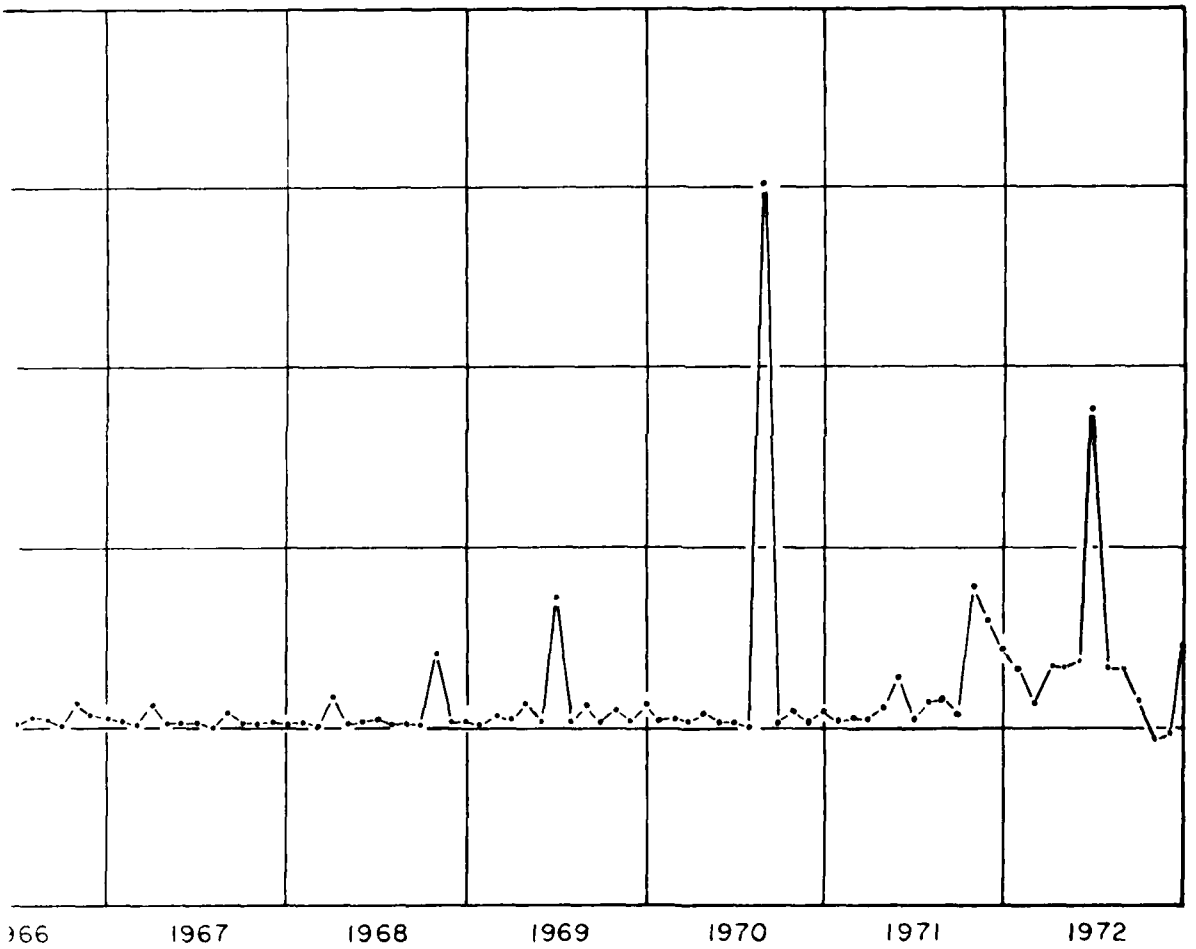
TABLE 5 (Cont.)

INFLOW-OUTFLOW W. KERR SCOTT RESERVOIR

CALENDAR YEAR	1972	1973	1974	1975	1976	1977	1978
Inflow (Acre-feet):							
January	50,445	42,178	59,308	42,735	50,777	28,443	79,314
February	40,024	60,590	51,537	46,862	36,244	24,306	37,791
March	42,705	86,513	46,238	108,964	35,354	62,347	68,736
April	42,593	82,738	77,374	63,846	38,120	65,559	46,790
May	66,179	86,039	50,253	65,417	36,024	34,671	56,996
June	64,389	57,219	47,173	82,726	61,012	31,110	
July	32,627	42,337	42,072	43,462	29,253	21,090	
August	26,487	69,872	53,738	31,492	22,462	20,463	
September	22,394	32,009	49,734	43,474	22,440	34,512	
October	22,107	31,787	27,534	58,985	76,758	26,509	
November	29,301	27,970	26,167	42,466	31,211	119,981	
December	43,552	74,781	34,798	32,147	43,171	46,059	
Outflow (Acre-feet):							
January	55,295	42,178	60,708	42,735	54,302	28,727	79,314
February	37,724	60,590	51,537	46,862	36,244	23,826	37,595
March	39,645	86,153	46,138	99,043	33,389	62,543	68,032
April	42,953	82,198	77,479	63,767	40,322	65,559	46,594
May	66,179	86,219	50,253	64,434	35,787	34,376	57,192
June	64,209	57,939	47,323	83,709	60,914	31,405	
July	32,717	42,337	41,997	43,462	29,729	25,614	
August	29,202	69,872	53,163	31,587	24,649	25,525	
September	25,894	36,809	49,734	43,379	26,761	25,824	
October	26,082	31,987	27,759	59,181	69,872	25,611	
November	23,436	27,970	25,742	42,466	31,495	119,687	
December	38,177	72,381	34,998	28,622	42,887	46,353	



NOTE:
- INDICATES THE HIGHEST POOL STAGE DURING THE MONTH FROM DAILY OPERATION REPORTS.



STAGE
Y

YADKIN-PEE DEE RIVER BASIN

W. KERR SCOTT RESERVOIR & DAM

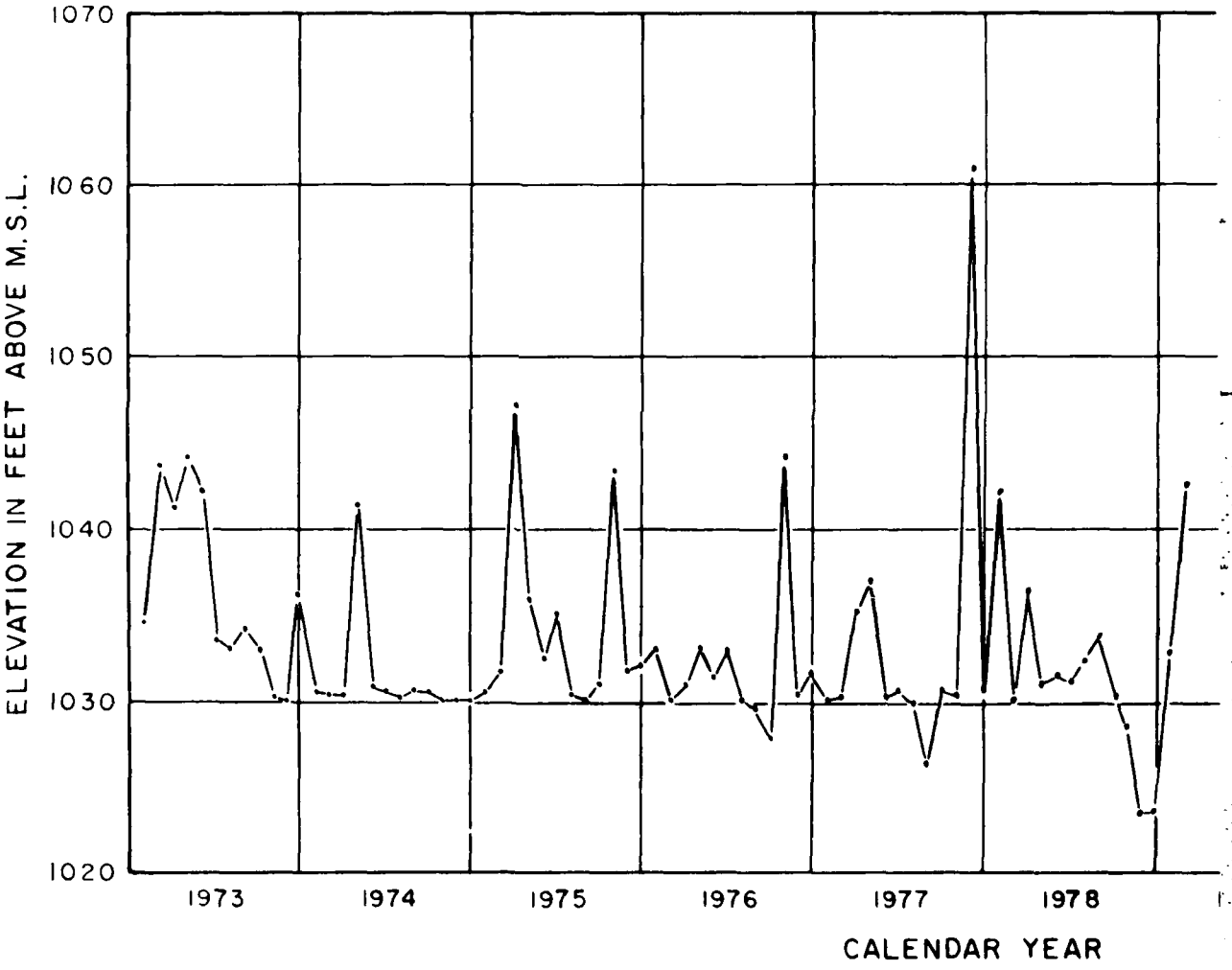
SEDIMENTATION RESURVEY

MONTHLY RESERVOIR STAGE

SCALE AS SHOWN

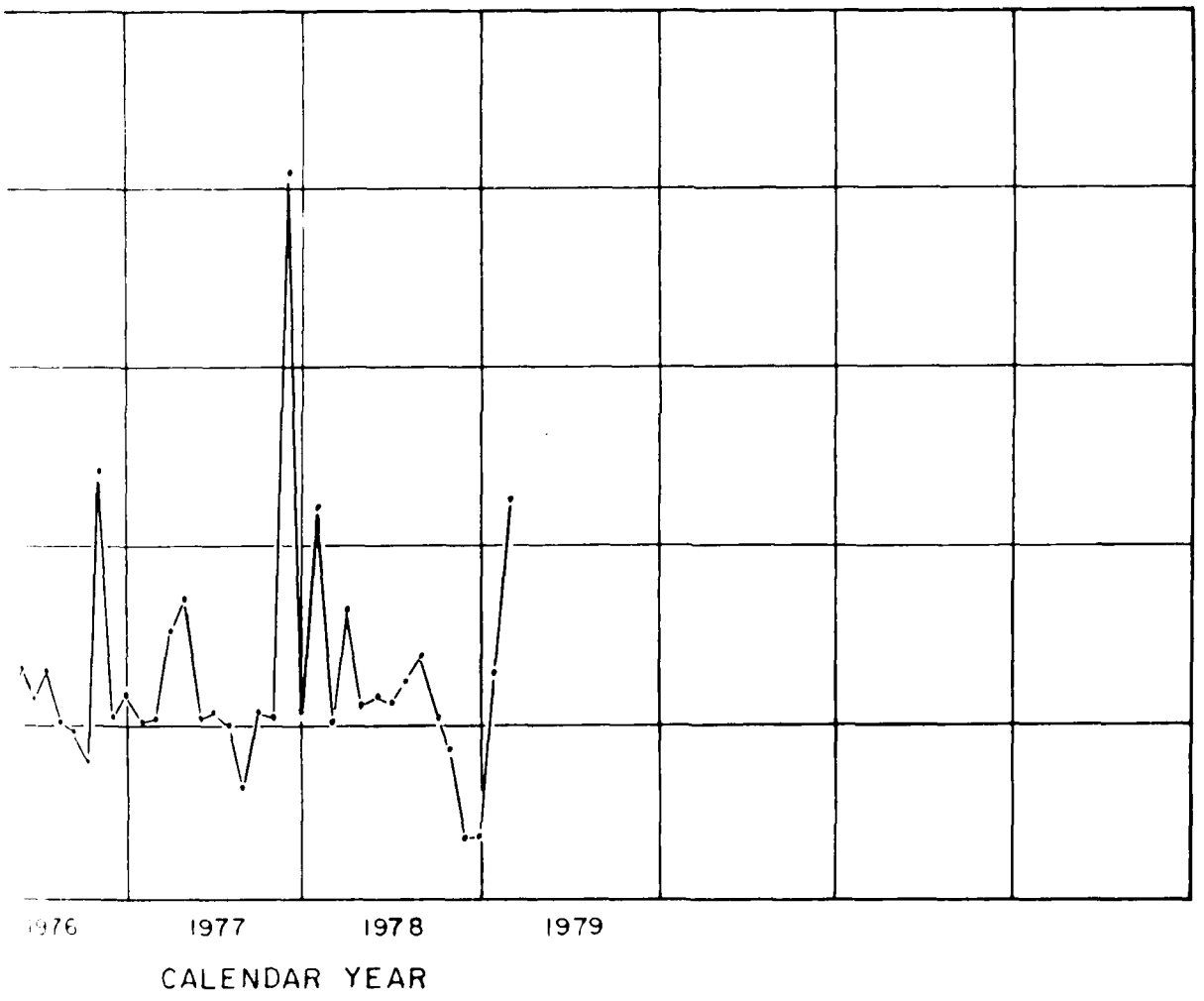
FIGURE 7

II



NOTE:

- INDICATES THE HIGHEST POOL STAGE DURING THE MONTH FROM DAILY OPERATION REPORTS.



L STAGE

YADKIN-PEE DEE RIVER BASIN

W. KERR SCOTT RESERVOIR & DAM

SEDIMENTATION RESURVEY

MONTHLY RESERVOIR STAGE

SCALE AS SHOWN

II

FIGURE 8

RELATIONSHIP OF HYDROLOGIC EVENTS FOR SEDIMENTATION RATES

29. Effects of sediment on storage. Sediment deposits having their source outside the reservoir deplete available storage while those originating from within tend only to redistribute stage capacity relationships. Effects of sediment deposits on project purposes, based on the information collected to date, are discussed in the following paragraphs.

30. Adequacy of storage allocated to sediment. The original allocation of storage for sediment was based upon siltation data for 13 reservoirs in North Carolina having similar watershed topography and ground cover. Their average annual sediment accumulation value of 0.4 acre-foot per square mile of drainage area was adopted. Thus far the sedimentation pool has been reduced 1136 acre-feet or 14.2 percent. Based on a 50-year project life the sediment pool appears to be adequately sized for the incoming sediment load.

31. Effect of sediment on storage allocated to water supply. Wilkes County, North Carolina, and the city of Winston-Salem, North Carolina, have contracted with the United States Government to purchase for municipal and industrial water supply that storage lying between elevations 1000 and 1030. Releases from this storage are made in accordance with their dictates, provided that such releases, when combined with normal runoff below the dam do not cause damaging floods. The 1978 sedimentation resurvey reveals that capacity between elevations 1000 and 1030 has been reduced 567 acre-feet, a reduction in capacity of 1.7 percent.

32. Effects of sediment on storage allocated to flood control. The effect of sedimentation on the flood control pool was computed to elevation 1045, or the lower 15 feet. Calculations above this elevation were not made since this pool level has only been exceeded four times during the 15.8 years of project operation. Table 3 shows there is a 373 acre-feet or 1.4 percent increase in storage capacity between elevation 1030 and 1045. This indicates degradation is occurring between these elevations; however, the sediment range plots show minor erosion has taken place since the last survey.

33. Effects of shoaling on tributary conveyance. No analysis was made regarding tributary conveyance during this study, nor is one planned. However, some photographs showing shoaling have been taken, some of which are shown in Appendix C.

34. Effects of operation on the tailwater channel. The outlet works were designed so that the maximum discharge to the channel below the dam is about 5400 cfs. There has been only two sustained periods where

the discharge has been maintained at this rate, and that was after the floods of August 1970 and November 1977. Two reports of damage, one as a claim, have been received, neither of which occurred as a result of these sustained releases. In 1975, the release schedule for flood pool drawdowns was revised to decrease the discharge as the water reached normal pool level. This was done to reduce the static pressure in the saturated river banks. The degradation ranges below the dam were resurveyed in September 1979. Comparison of this survey with the 1971 survey (Figure A-10, Appendix A) shows that minor changes have occurred and are not causing any problems.

35. Effect of operation on sedimentation. Reservoir stage has a great bearing on the location of delta formations. A review of the monthly reservoir operation reports have shown that the normal reservoir fluctuation is confined to a rather narrow range of several feet except during periods when floodwaters were being stored or when releases were being made to augment downstream flows. Areas where conditions are suitable for delta formations are, therefore, found immediately downstream of points of tributary confluence with the normal pool. During flood periods, the reservoir manager has observed that the inflow and outflow are muddy while the reservoir surface remains relatively clear. This phenomenon may be attributed to the underflow of heavier silt-charged inflows beneath the lighter, desilted stored waters. Gate location and operating practices help to pass some of the suspended material through the reservoir thereby preventing it from settling out.

CONCLUSIONS

36. Project future sediment rates. If shoaling rates identified by this analysis are representative of those that will be experienced in the future, then the storage allocated to sediment is adequate. It is evident that some of the load carried into the reservoir is passing through without being trapped. This fact implies that the sediment load of tributaries to the reservoir is higher than it appears to be when looking only at the accumulation of sediments within the reservoir.

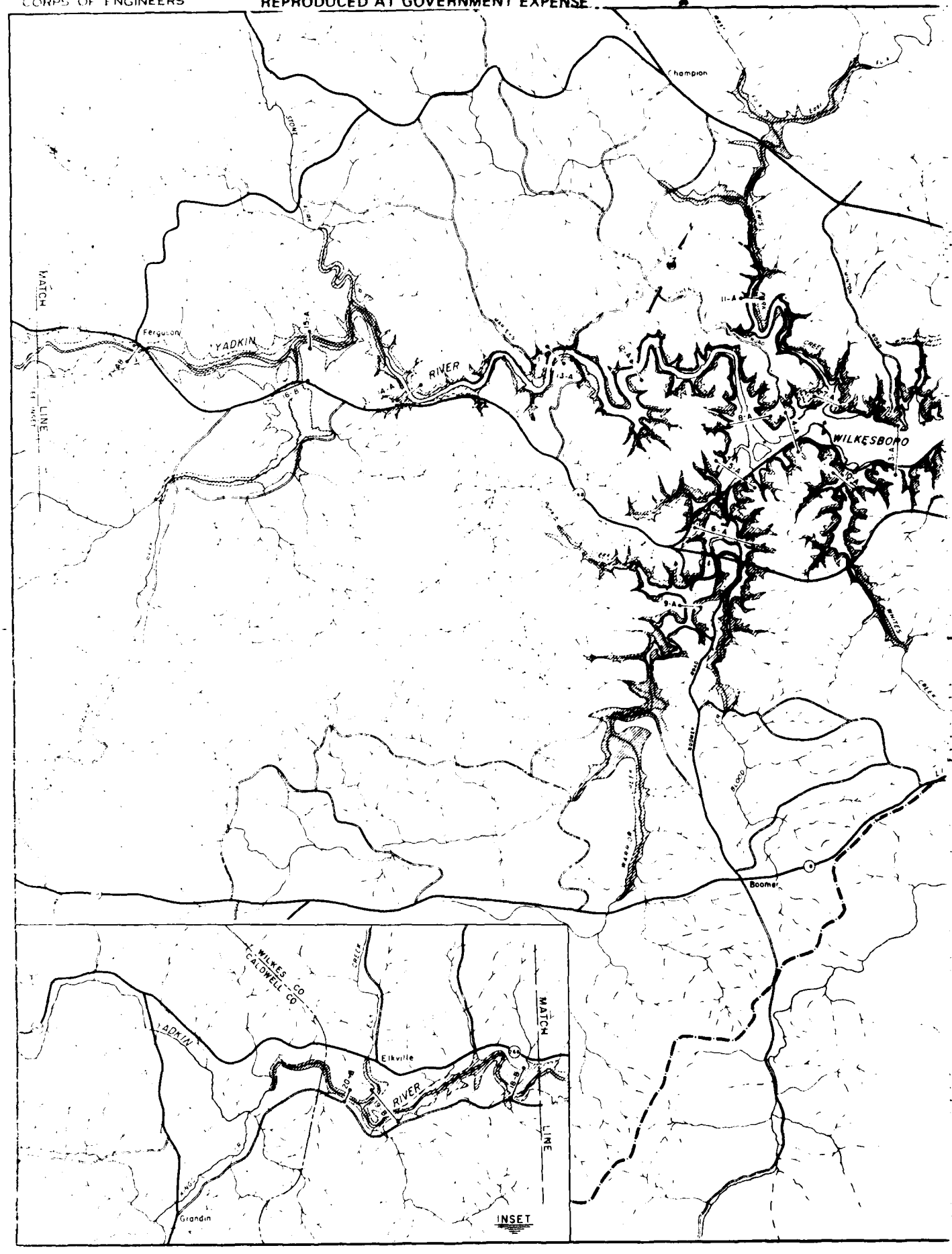
37. Need for operational changes. No problems were uncovered that would suggest the need for a change in operational procedures.

38. Need for erosion control structure. There is no apparent need for erosion control structures. Local problem areas, particularly

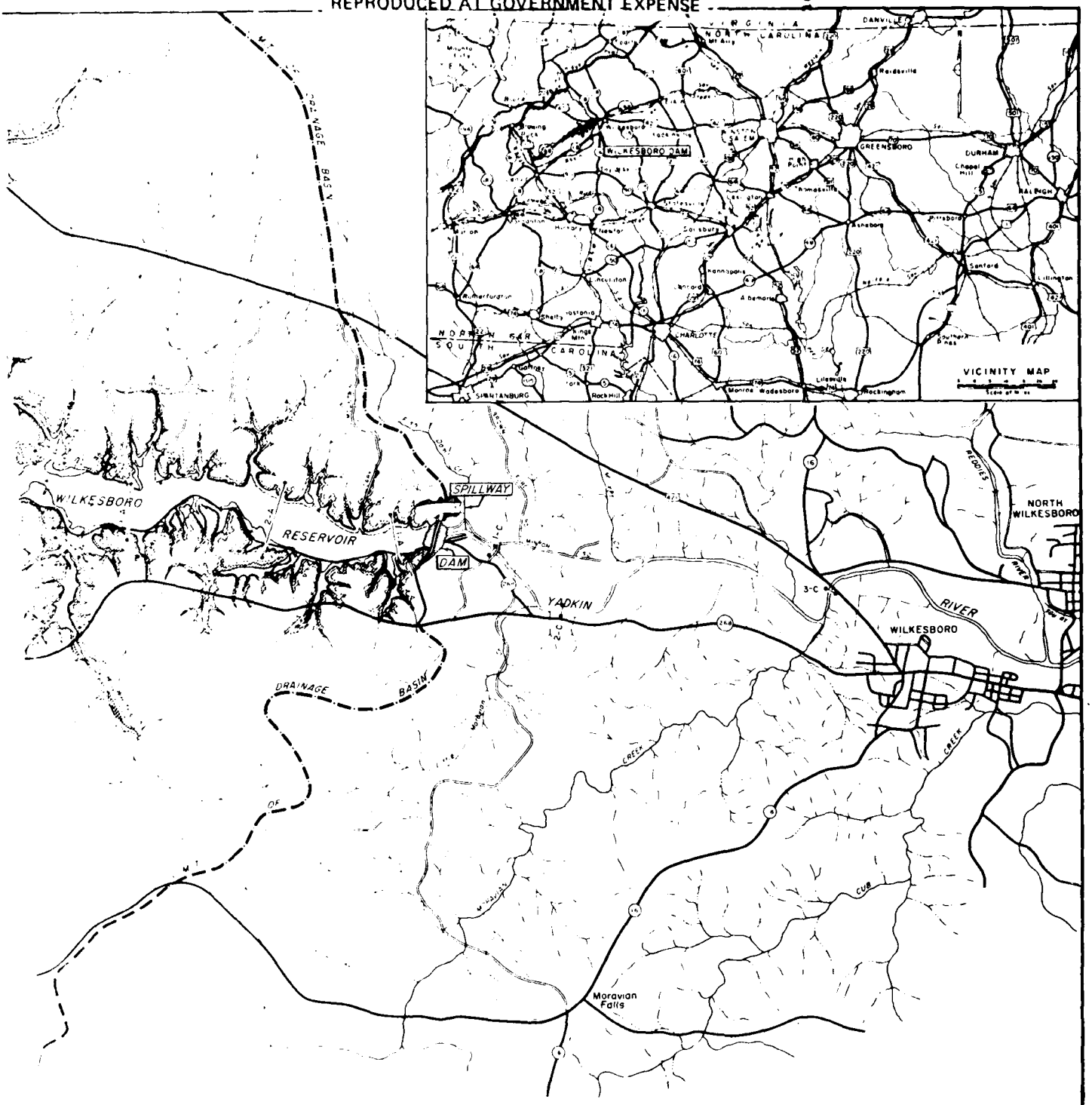
APPENDIX A

CROSS SECTIONS, SEDIMENT & DEGRADATION RANGES

TABLE OF CONTENTS



U. S. ARMY



LEGEND

SCALE OF MAPS
FEDERAL
STATE
MAJOR STREAMS
MAJOR WATER DISTRIBUTION
RAILROADS
COUNTY LINE
LEVEE OR DIKE
MAXIMUM FLOOD POOL
STORAGE ZONE
SEDIMENT RANGE

ELEVATIONS ARE IN FEET AND REFER TO MEAN SEA LEVEL

GRAPHIC SCALES

REVISION	DATE	DESCRIPTION	BY	APPROVED
2	10 24 78	Relocated Ranges 11A THRU 14A & 17AB	WTH	JWN
1	6 26 72	To Agree With Field Location Added Ranges 15A THRU 20B	TBR	JJL

U S ARMY ENGINEER DISTRICT, CHARLESTON
CORPS OF ENGINEERS
CHARLESTON, S C

YADKIN RIVER, NORTH CAROLINA
WILKESBORO RESERVOIR

SEDIMENT & DEGRADATION RANGES
SITE PLAN

APPROVAL RECOMMENDED

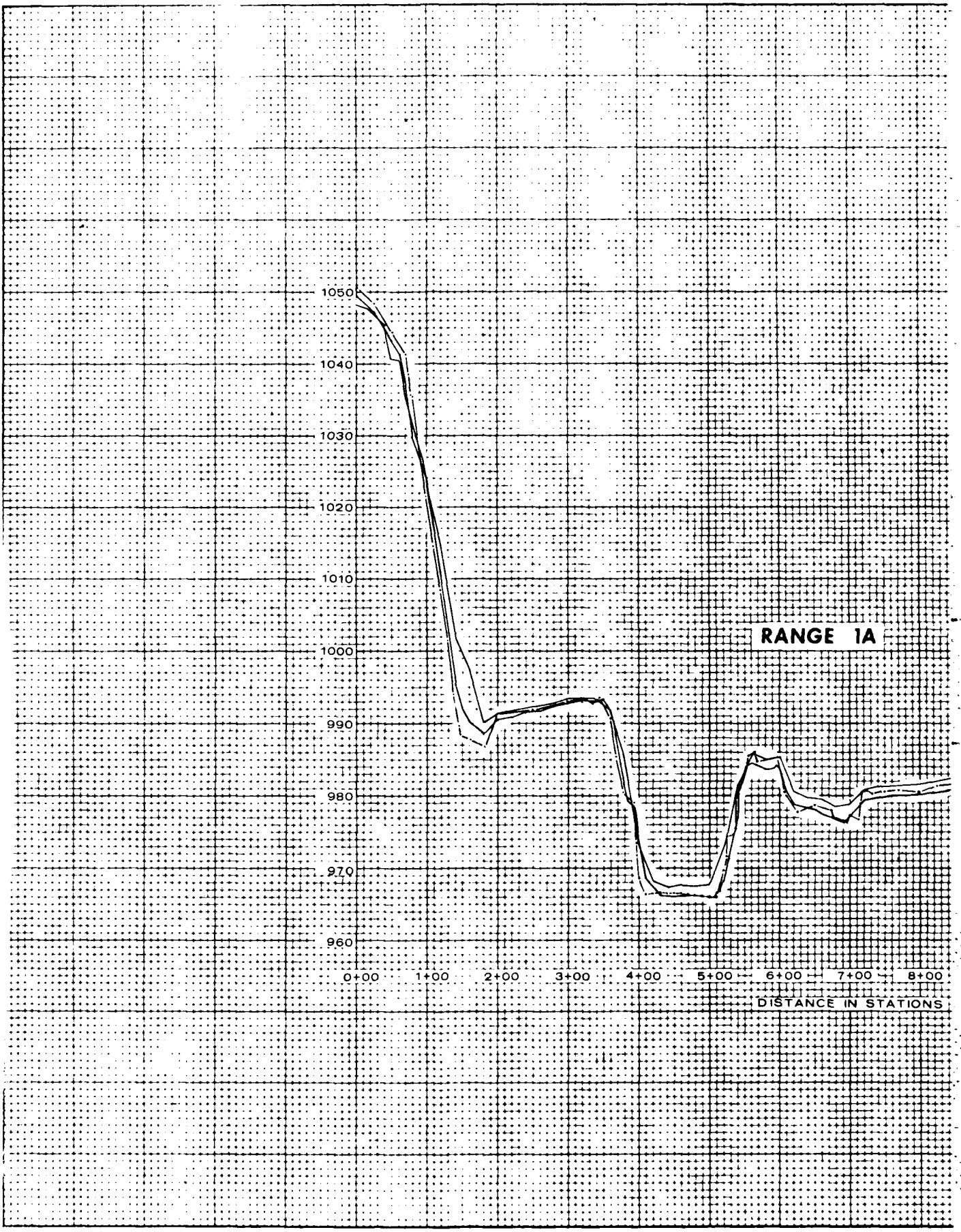
DATE 18 Sept 1962

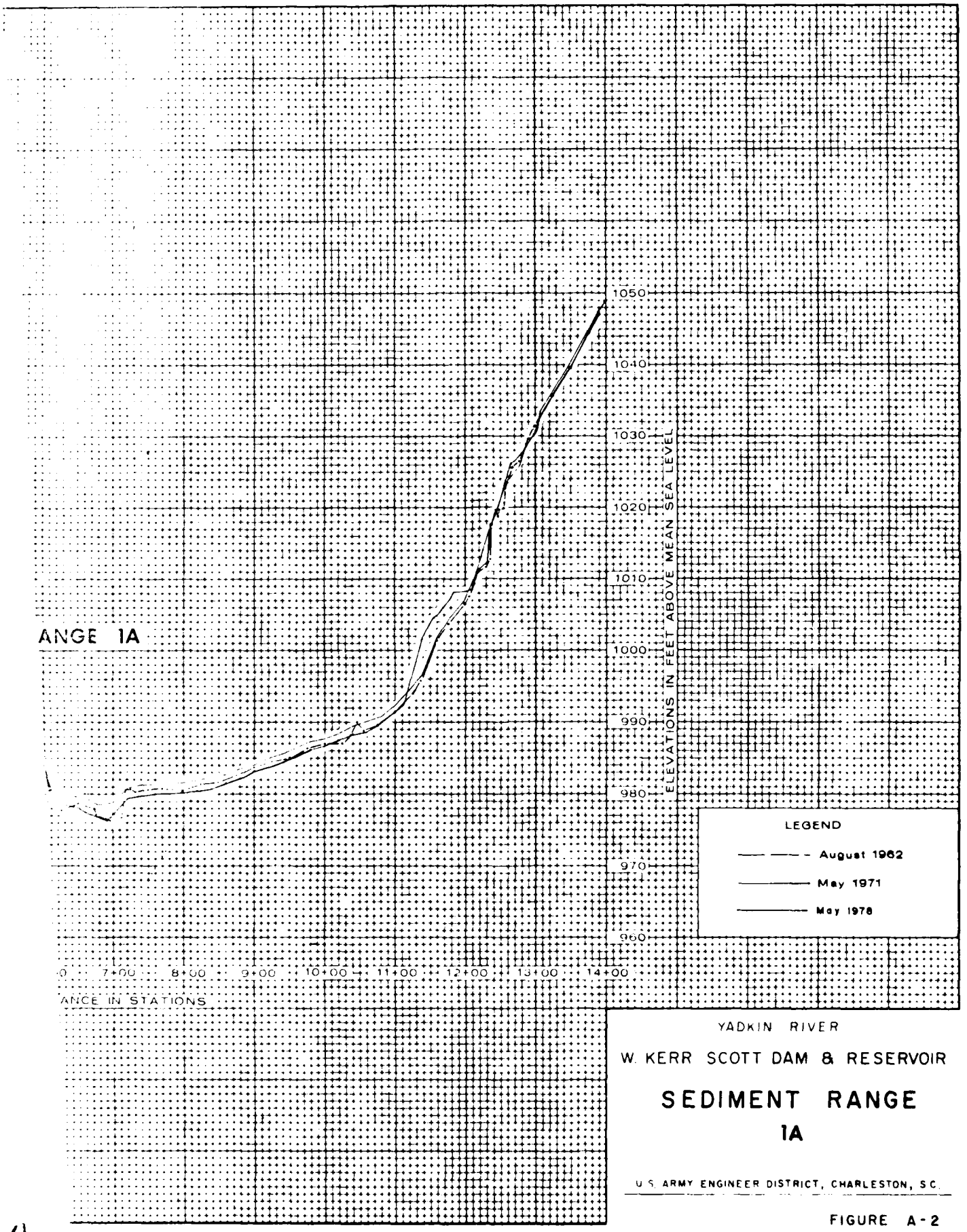
SCALE AS SHOWN
SPEC SERIAL NO
DRAWING NO 5821
SHEET 1 OF 1 SHEETS

FIGURE A-1

2,

II





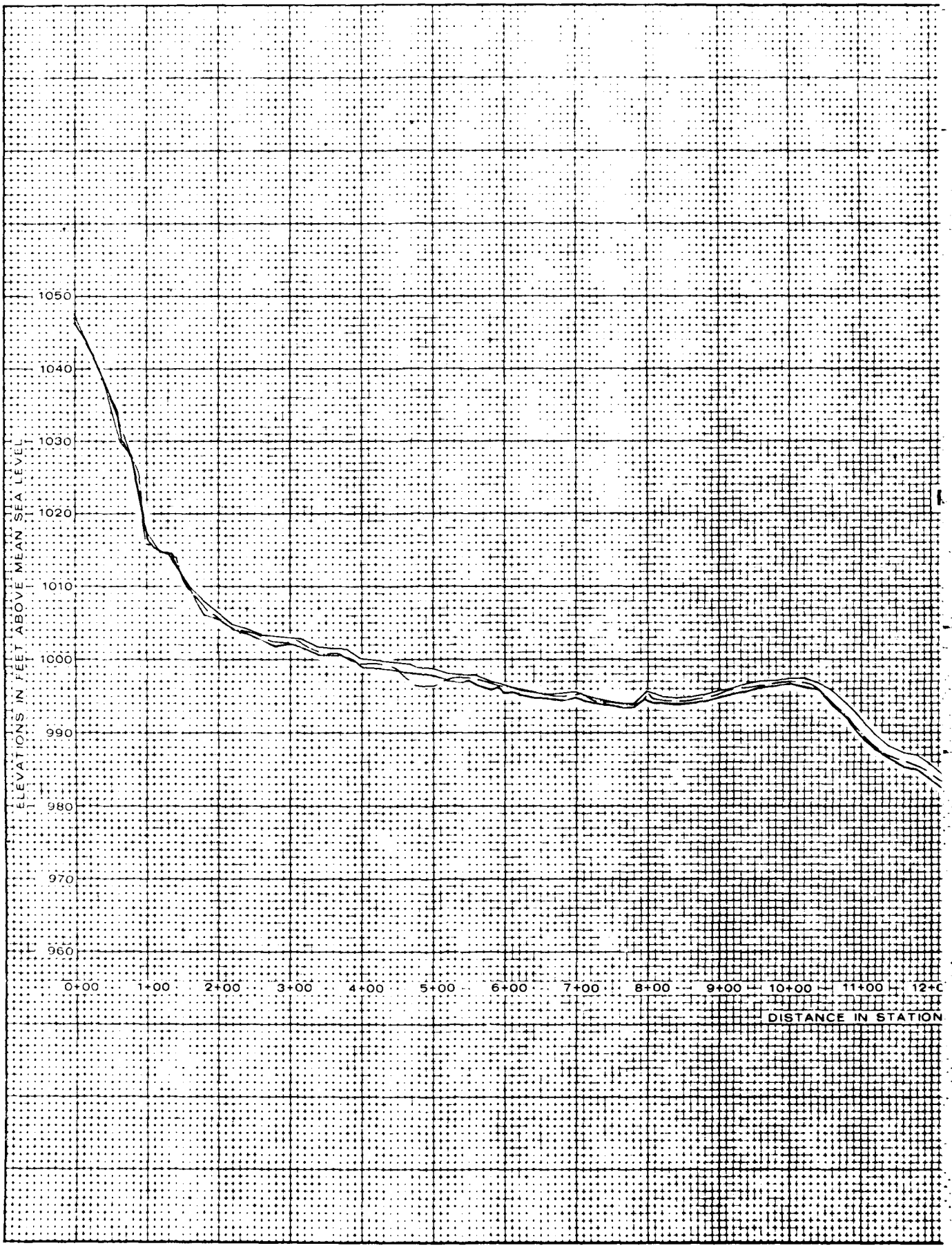
YADKIN RIVER

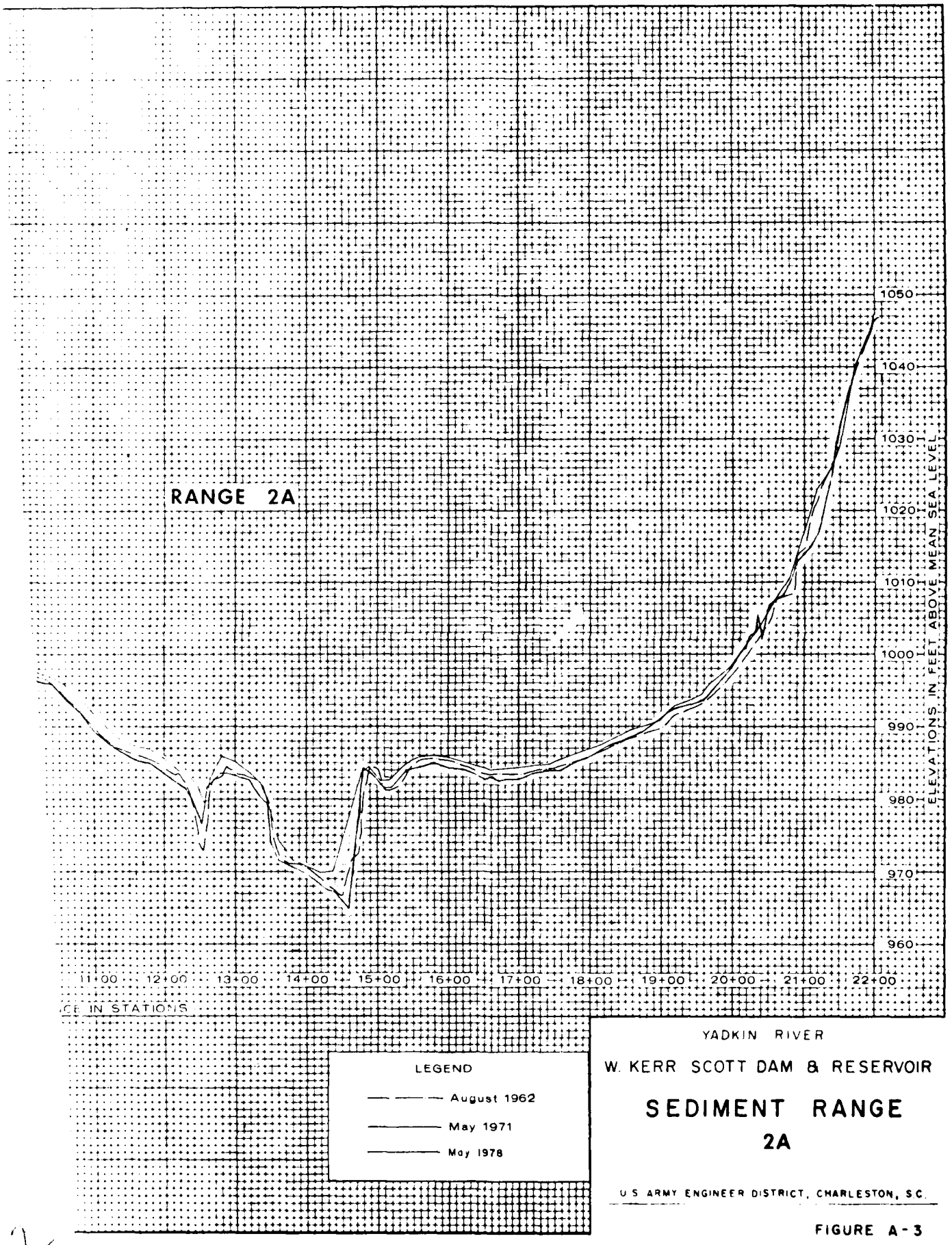
W. KERR SCOTT DAM & RESERVOIR

SEDIMENT RANGE 1A

U.S. ARMY ENGINEER DISTRICT, CHARLESTON, S.C.

FIGURE A-2





YADKIN RIVER

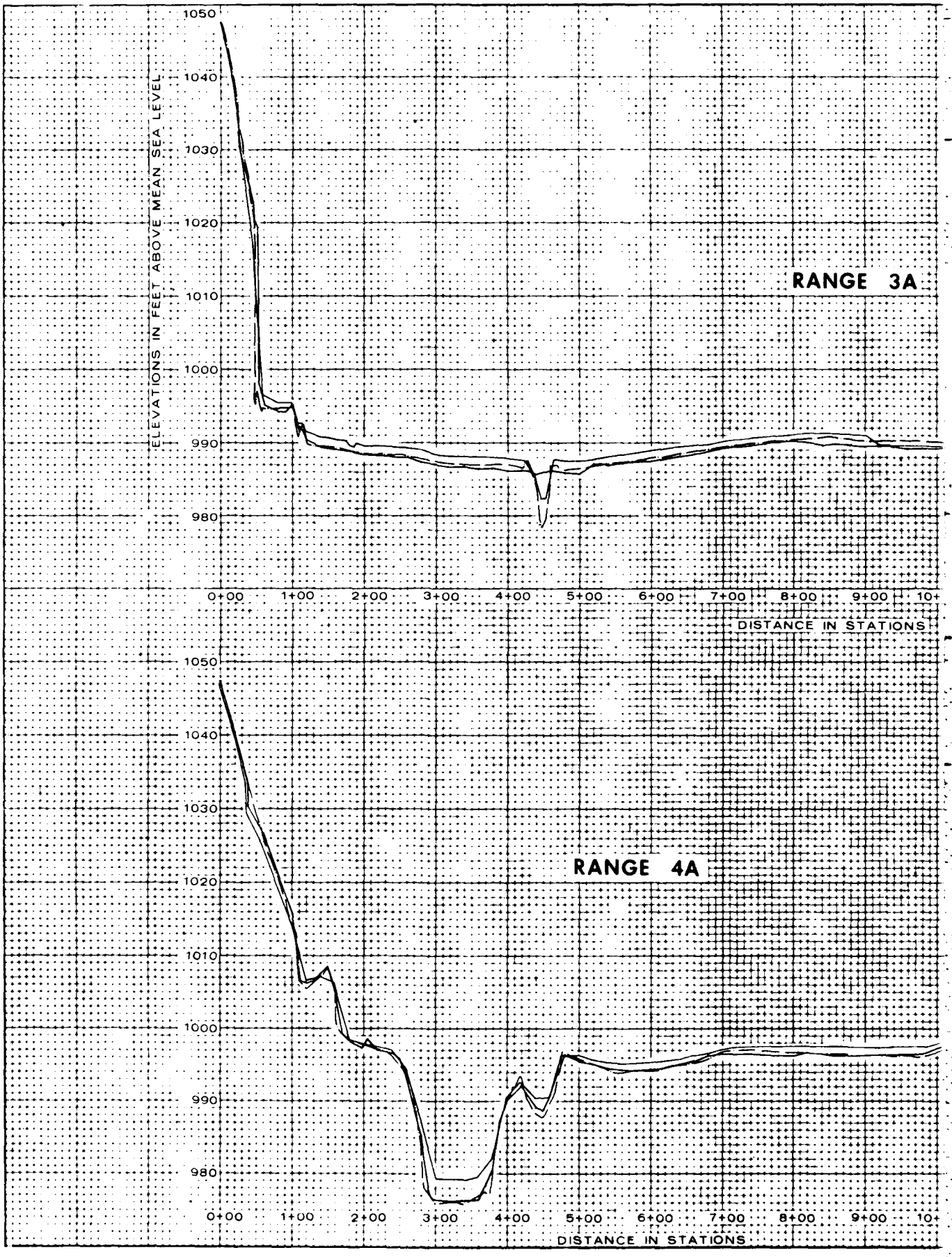
W. KERR SCOTT DAM & RESERVOIR

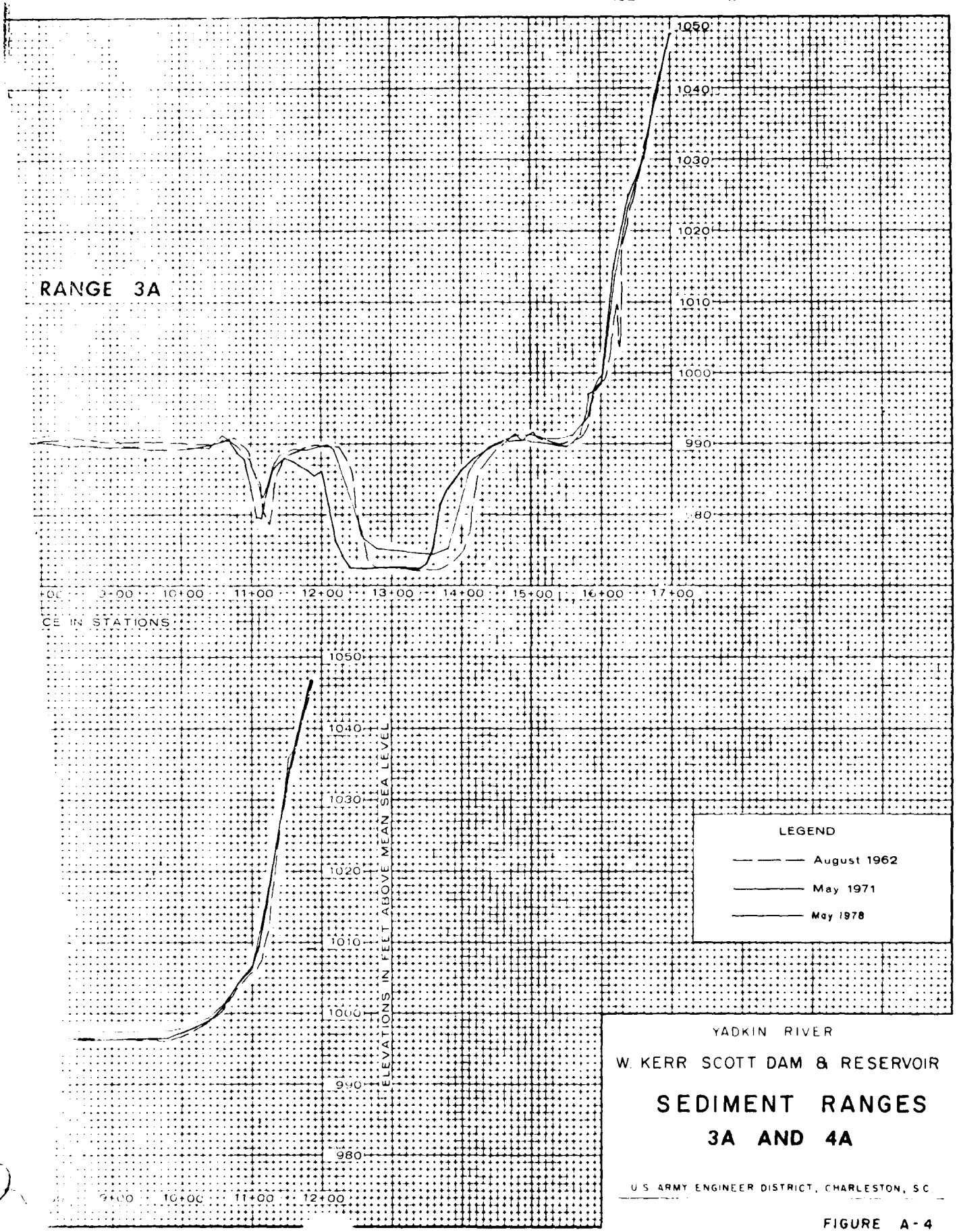
SEDIMENT RANGE 2A

U.S. ARMY ENGINEER DISTRICT, CHARLESTON, S.C.

FIGURE A-3

II





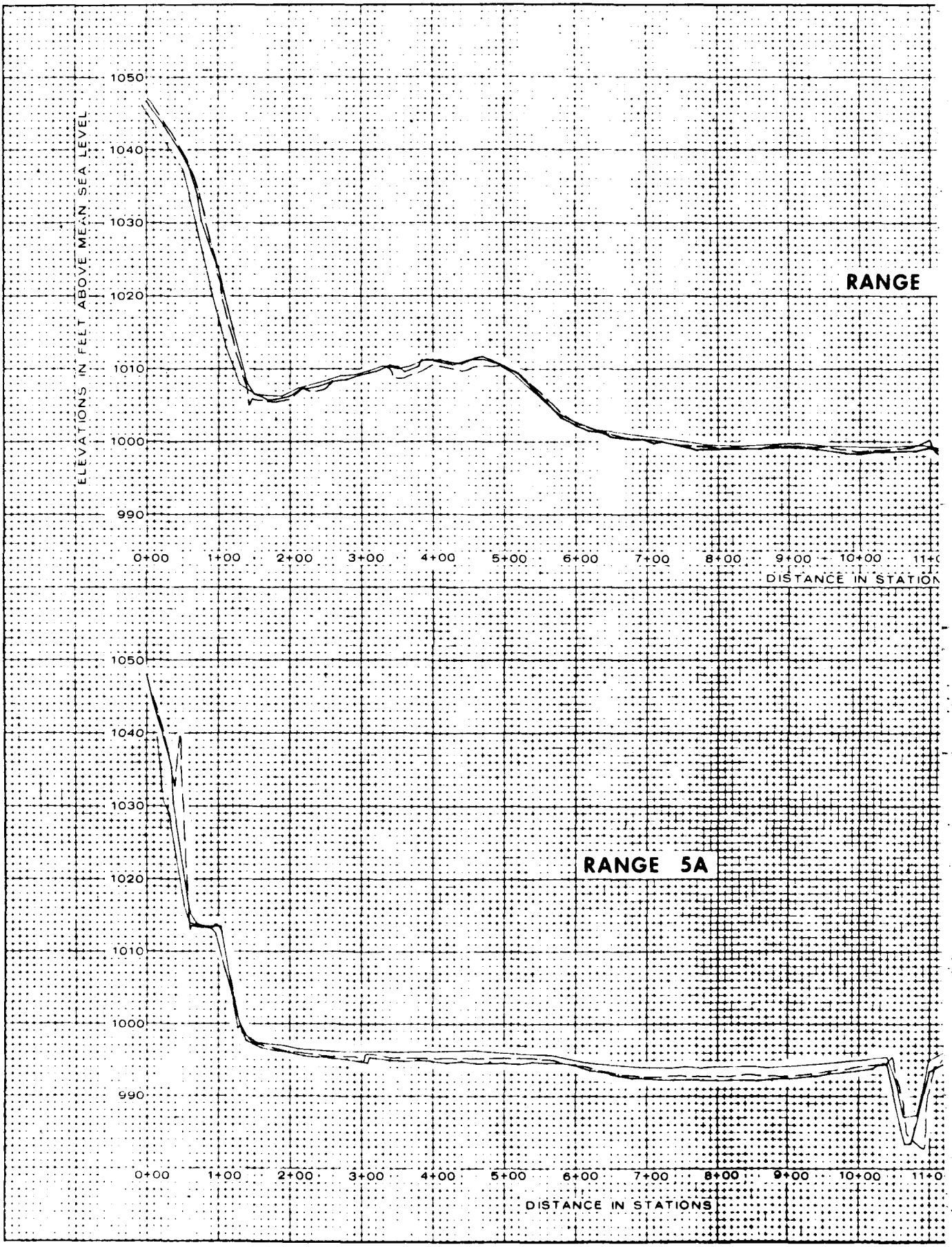
YADKIN RIVER

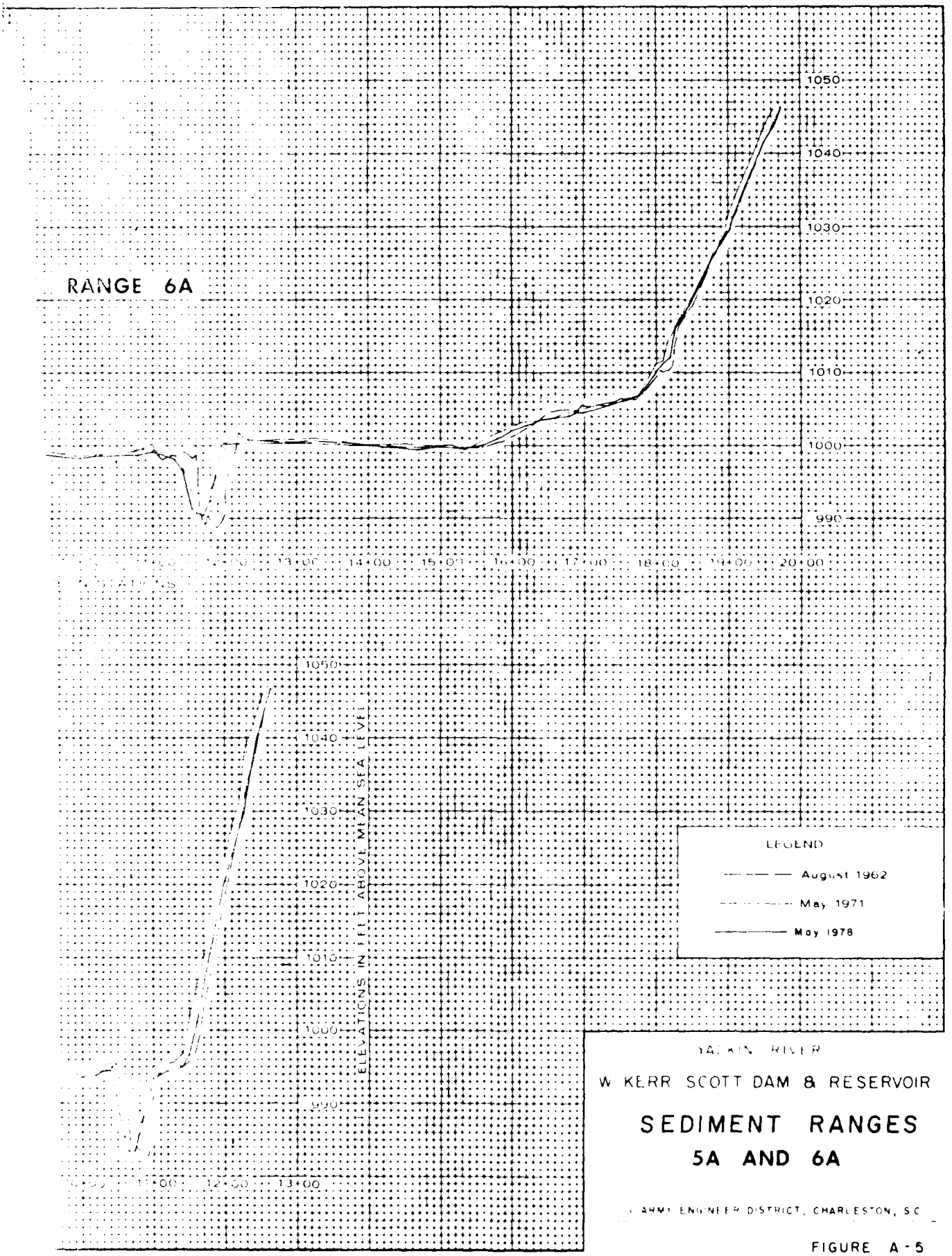
W. KERR SCOTT DAM & RESERVOIR

SEDIMENT RANGES 3A AND 4A

U.S. ARMY ENGINEER DISTRICT, CHARLESTON, S.C.

FIGURE A-4





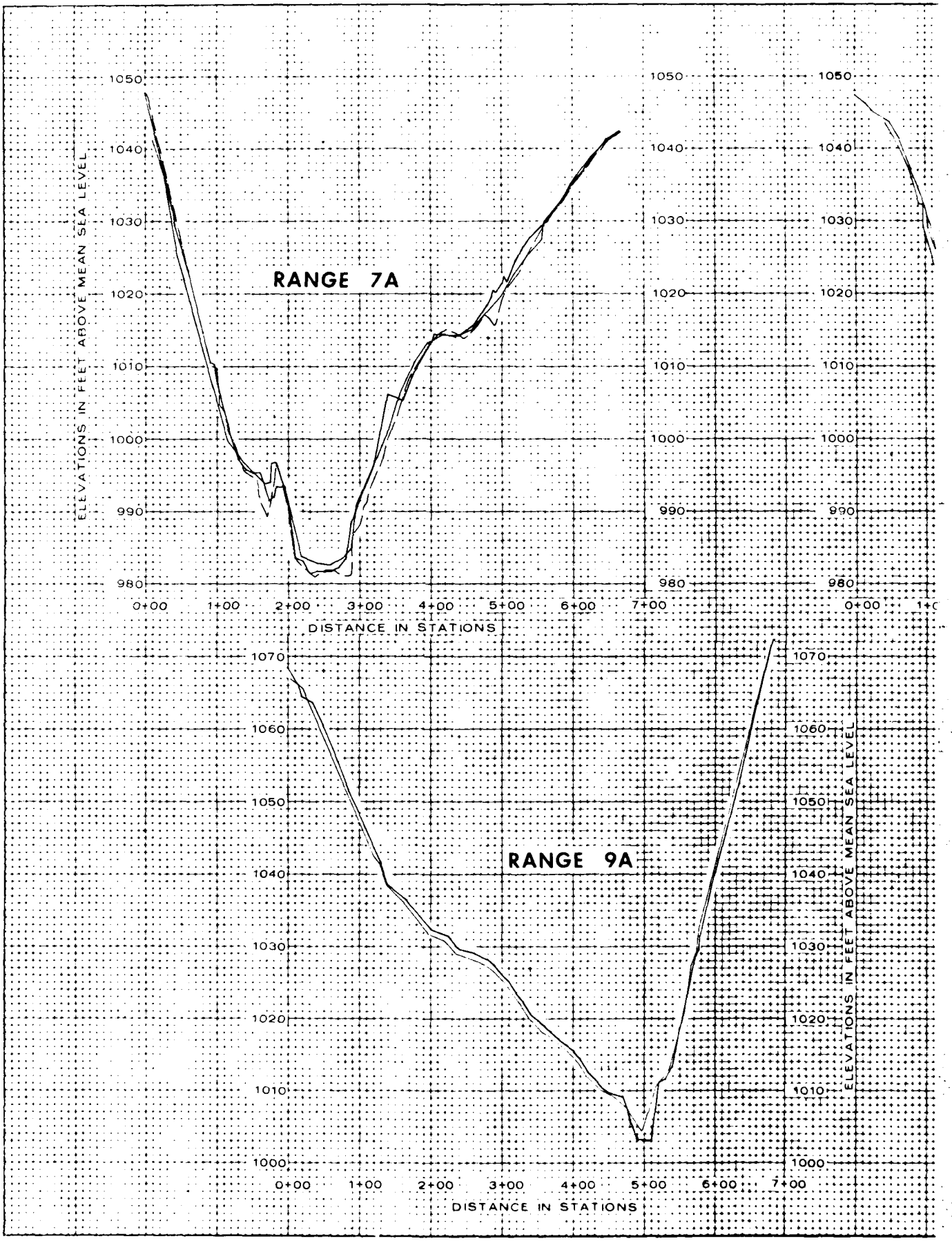
YADKIN RIVER

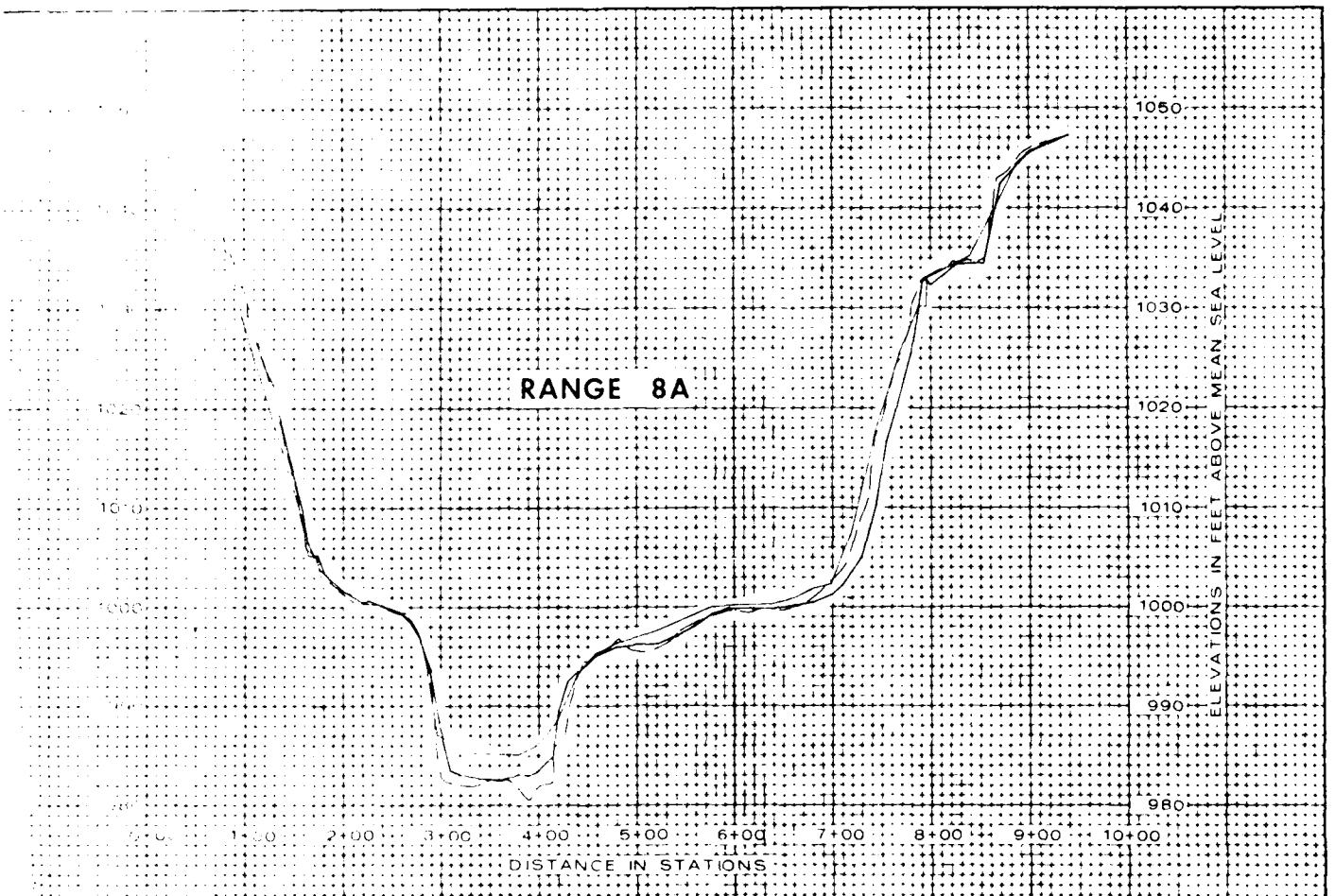
W KERR SCOTT DAM & RESERVOIR

SEDIMENT RANGES
5A AND 6A

ARMY ENGINEER DISTRICT, CHARLESTON, SC

FIGURE A-5





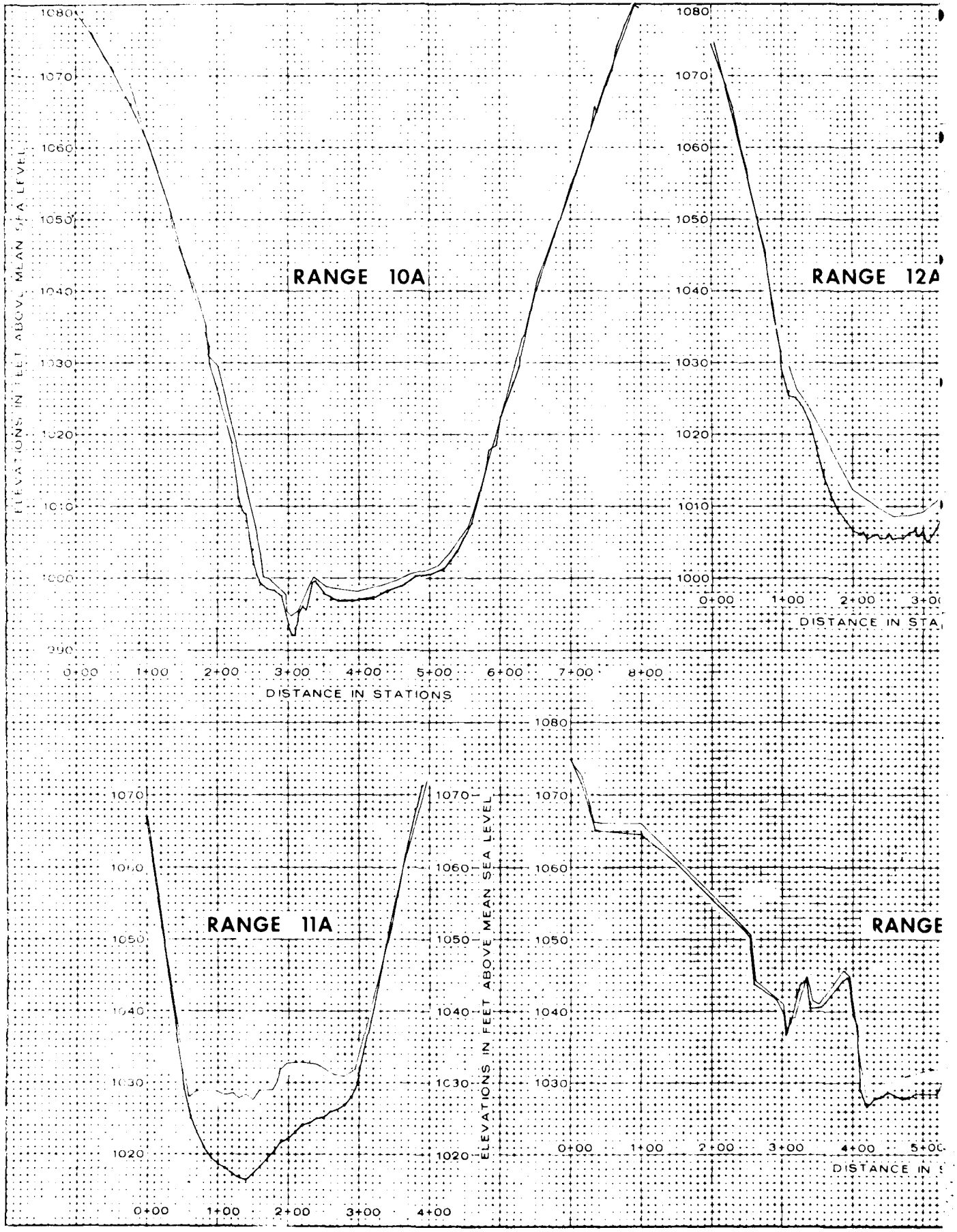
YADKIN RIVER

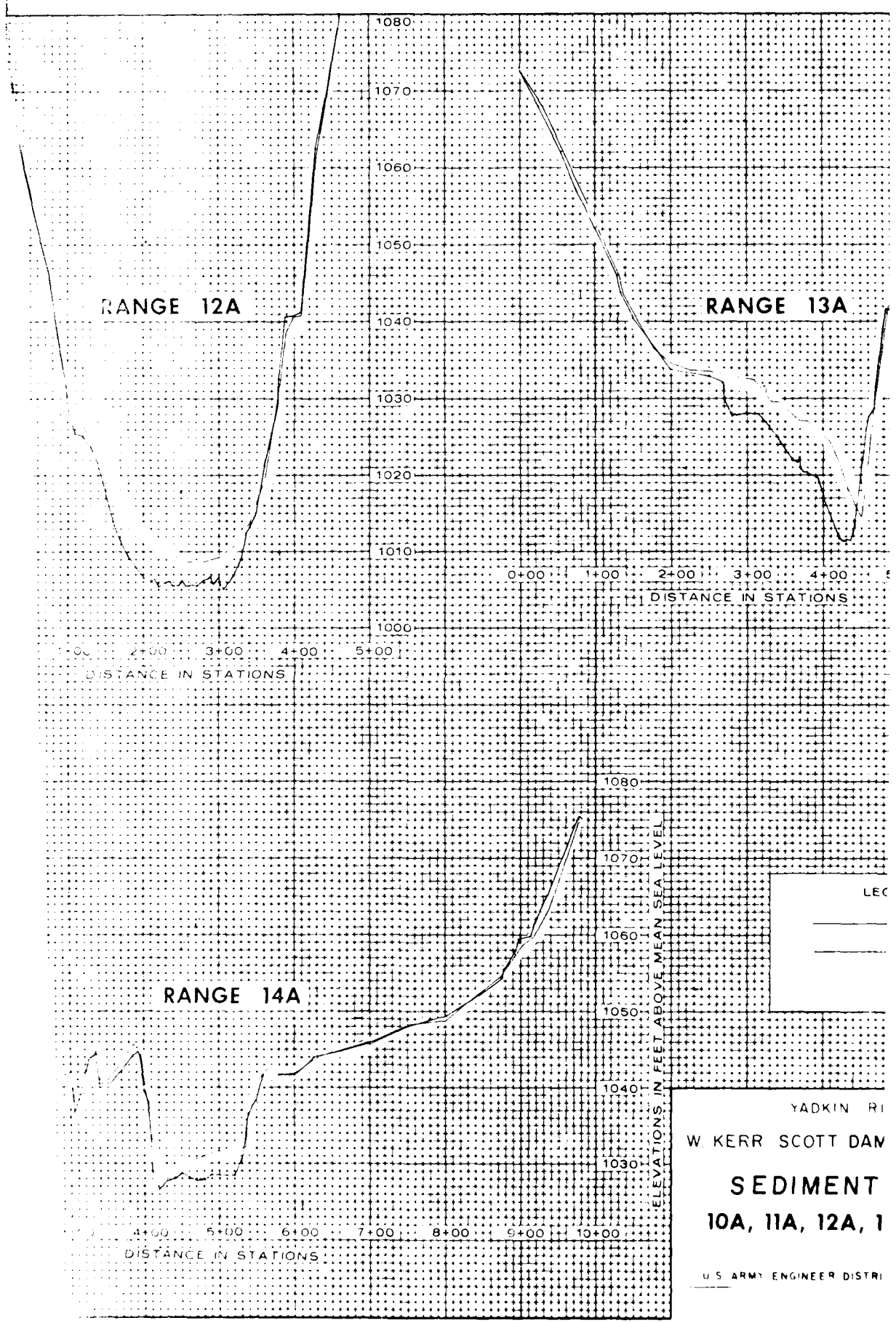
W KERR SCOTT DAM & RESERVOIR

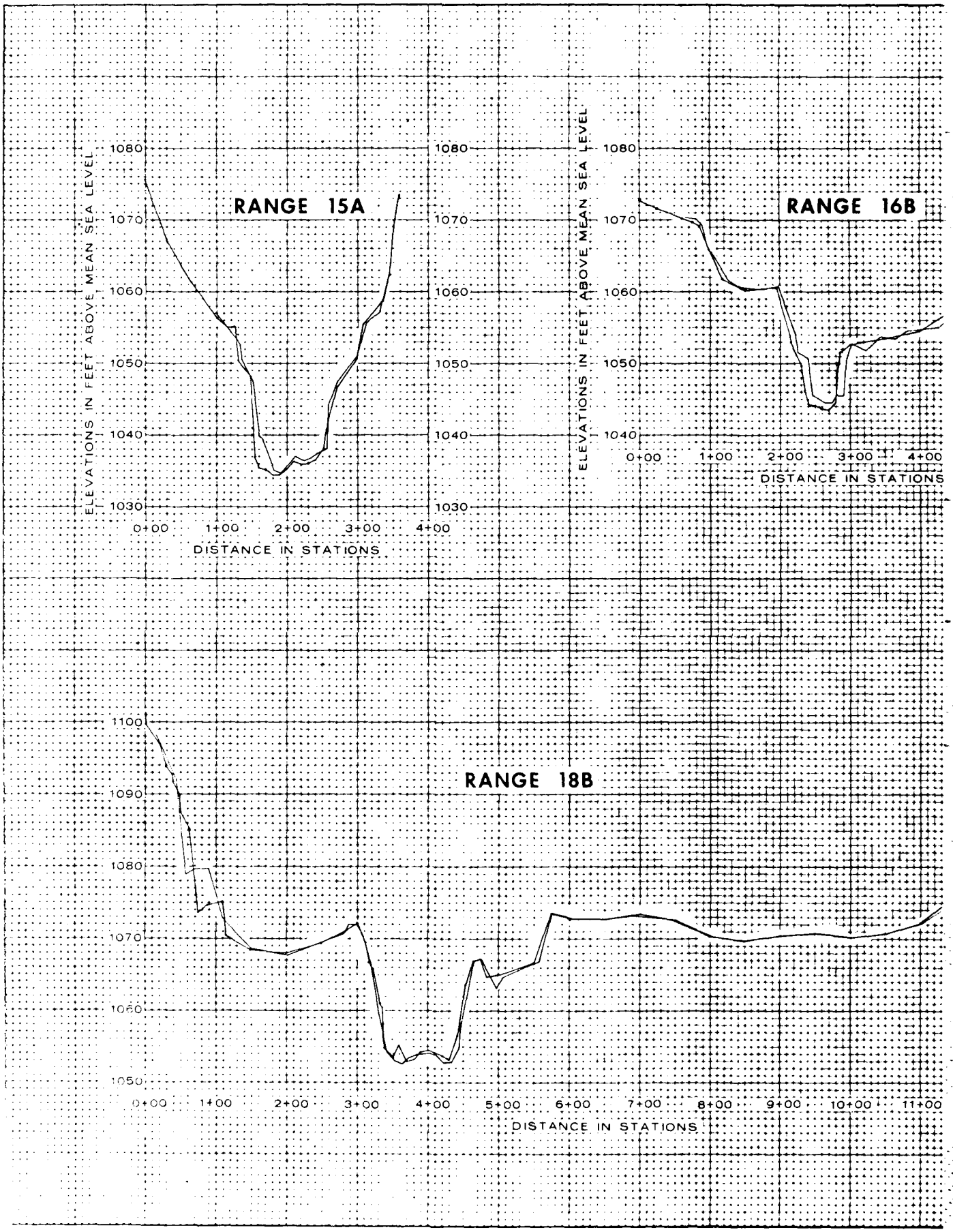
SEDIMENT RANGES
7A, 8A AND 9A

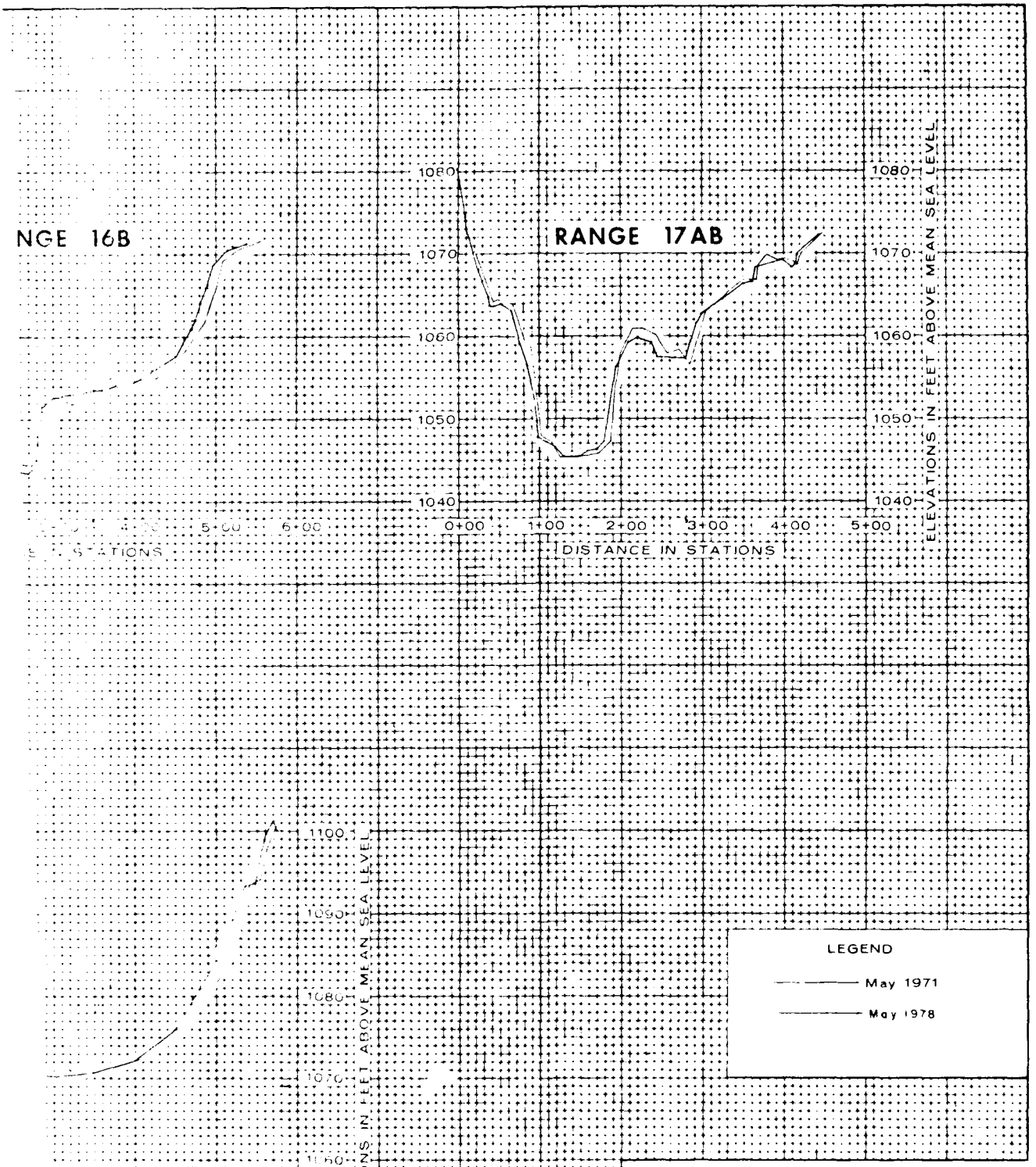
U.S. ARMY ENGINEER DISTRICT, CHARLESTON, S.C.

FIGURE A-6









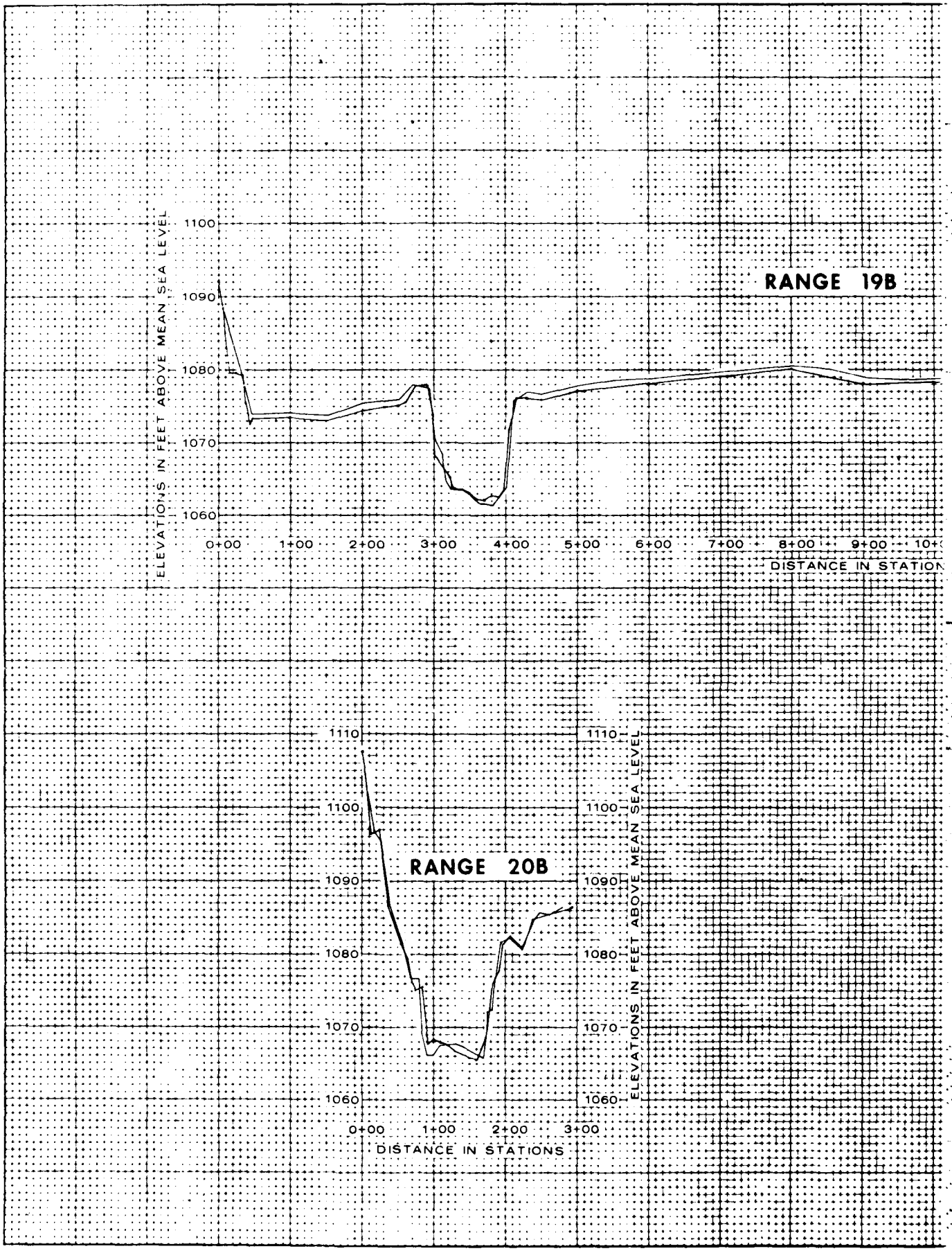
YADKIN RIVER

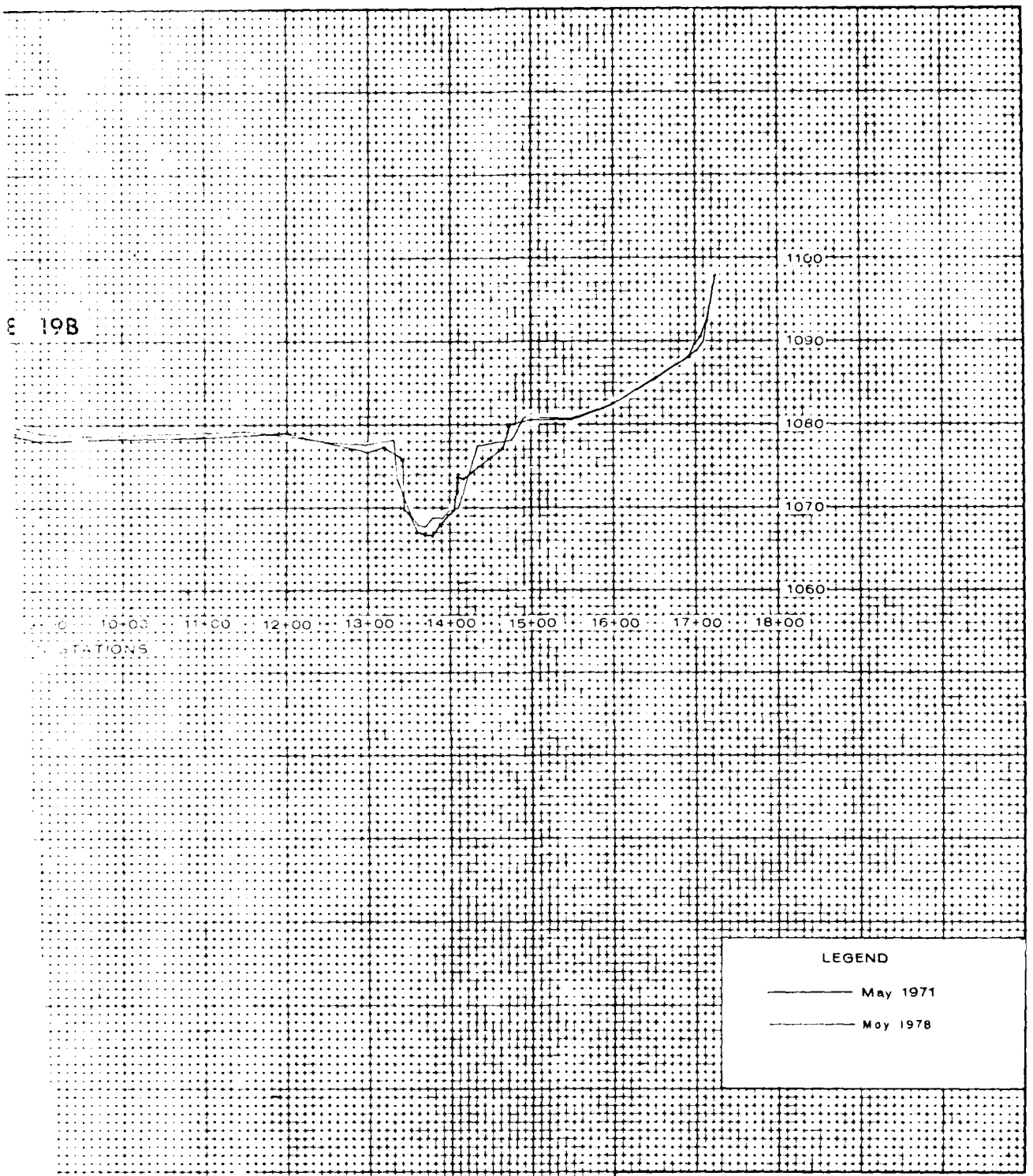
W KERR SCOTT DAM & RESERVOIR

SEDIMENT RANGES
15A, 16B, 17AB AND 18B

U.S. ARMY ENGINEER DISTRICT, CHARLESTON, S.C.

FIGURE A-8





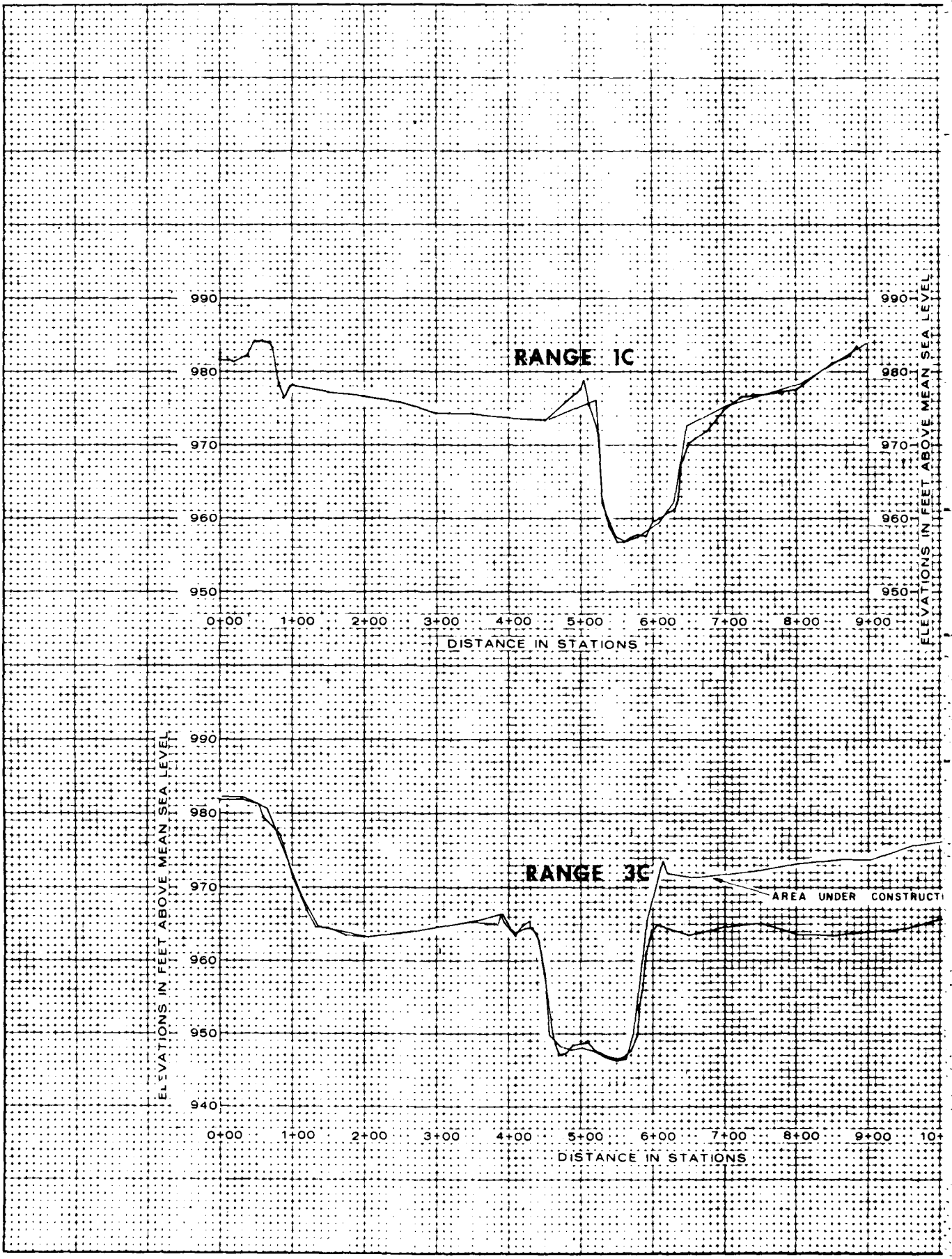
YADKIN RIVER

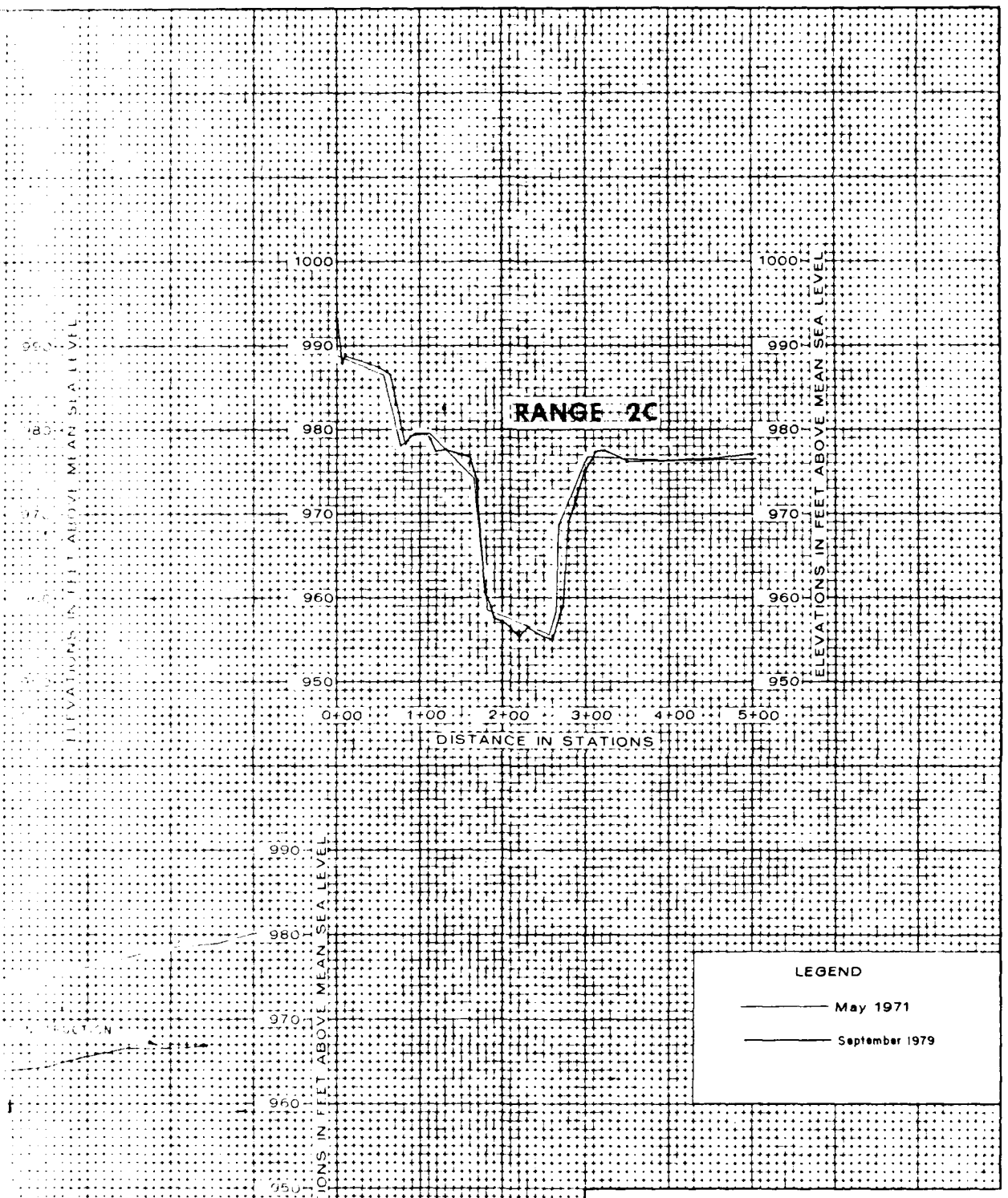
W. KERR SCOTT DAM & RESERVOIR

SEDIMENT RANGES
19B AND 20B

U S ARMY ENGINEER DISTRICT, CHARLESTON, S.C.

FIGURE A-9





YADKIN RIVER

W KERR SCOTT DAM & RESERVOIR

DEGRADATION RANGES 1C, 2C AND 3C

U.S. ARMY ENGINEER DISTRICT, CHARLESTON, S.C.

FIGURE A-10

APPENDIX B

METHOD FOR REVISING STAGE-CAPACITY CURVES

TABLE OF CONTENTS

TEXT

TABLES

APPENDIX B

METHOD OF REVISING STAGE-CAPACITY CURVES

DISCUSSION

1. Purpose. The purpose of this appendix is to explain the method used to convert data on incremental areas at survey ranges to incremental volume.

2. Discussion of method. The reservoir is divided into reaches separated by sedimentation range lines. Reaches are bounded by range lines and by natural or artificial physical features. For example, that portion of the reservoir lying between the dam and range 1A constitutes a single reach, and that portion between range lines 1A and 2A constitutes a second reach. The sum of the capacities in all reaches equals the total reservoir capacity. Results of computations of the original reservoir capacity are presented in Table B-1. These values are based on topographic maps prepared by Piedmont Engineering Service in January 1958. Surface areas at 10-foot increments of stage were planimetered from these maps, and the volume computed using the average-end-area method.

3. Coefficients were then developed by reach to relate the sum of the area between contour intervals at range lines to incremental capacity. These coefficients vary for each contour interval and between reaches. The coefficients are empirical and have the dimensions of acre-feet per square feet. For range 1A through 8A, 1962 range survey data was used to develop the coefficients. Survey data collected in 1971 was used for the remaining ranges. Coefficients above elevation 1045 were not developed since this pool level has only been exceeded four times during the 15.8 years of project operation.

4. An example of coefficients derivation is as follows: The capacity in acre-feet between elevation 1,000 and 1,010 in the reach from 1A to 2A is 1928.95 acre-feet (1962 survey). The incremental area between elevation 1,000 and 1,010 of range line 1A and 2A is 10,609 and 18,178 square feet, respectively (1962 survey). The corresponding coefficient therefore, is as follows:

$$C = \frac{1928.95 \text{ Ac. Ft.}}{10609 \text{ Sq. Ft.} + 18178 \text{ Sq. Ft.}} = .0670 \ \frac{\text{Ac. Ft.}}{\text{Sq. Ft.}}$$

This and other coefficients are presented in Table B-2.

5. An example of coefficient use is as follows: Incremental capacity in 1978 between elevation 1,000 and 1,010 in reach from 1A to 2A is computed by multiplying the sum of cross sectional areas between these limits (see Table B-3) by the coefficient .0670 (see Table B-2). Incremental capacity for the example therefore equals:

$$(10550 \text{ Sq. Ft.} + 18140 \text{ Sq. Ft.}) \times .0670 \ \frac{\text{Ac. Ft.}}{\text{Sq. Ft.}} = 1922.23 \text{ Ac. Ft.}$$

Capacities to elevation 1045 using 1978 survey data were computed using this same procedure with results being tabulated in Table B-4.

6. Coefficients developed thus far will facilitate the derivation of stage-capacity relationships in future years to elevation 1045.

TABLE B-1
ORIGINAL CAPACITY (AC-FT)

(Computed Using Topographic Map Prepared in 1958)

Reach Defined By	960 to 970	970 to 980	980 to 990	990 to 1000	1000 to 1010	1010 to 1020	1020 to 1030	1030 to 1040	1040 to 1045
Dam to 1-A	16.55	86.35	156.55	209.25	263.88	297.29	322.75	340.10	203.20
1-A to 2-A	93.60	281.60	762.25	1457.25	1928.95	2271.18	2599.85	2854.10	1733.00
2-A to 3-A	111.15	325.80	825.50	1487.75	1953.56	2312.91	2553.25	2736.80	1650.02
3-A to 7-A to 4-A to 10-A	28.70	136.10	291.20	1056.65	1966.33	2259.09	2426.60	2475.50	1373.51
4-A to 5-A to 8-A	-	45.05	109.30	311.90	748.71	1082.82	1212.70	1266.60	731.29
5-A to 6-A	-	-	1.55	87.20	311.05	521.35	684.00	867.86	558.96
6-A to 9-A	-	-	.002	30.45	264.60	655.62	974.45	1184.30	770.63
9-A to Upstream	-	-	-	-	.003	44.39	164.95	154.81	255.64
14-A to 15-A	-	-	-	-	-	-	-	146.67	185.44
8-A to 12-A	-	-	44.90	213.60	532.60	804.38	973.60	1149.24	715.88
12-A to 13-A	-	-	-	-	122.22	352.70	525.55	724.67	515.10
13-A to 14-A	-	-	-	-	-	8.00	168.25	403.94	326.98
10-A to Upstream	-	-	-	5.85	57.56	181.74	329.00	485.21	337.64
7-A to 11-A	-	-	24.20	104.60	250.20	408.61	543.30	688.56	455.04
11-A to Upstream	-	-	-	-	-	.02	21.55	121.23	133.88
15-A to 16-B to 17-AB	-	-	-	-	-	-	-	-	53.42
16-B to Upstream	-	-	-	-	-	-	-	-	.58
Total	250.	875.	2215.	4965.	8400.	11200.	13500.	15600.	10000.
Accumulated Total	250	1125.	3340.	8305.	16705.	27905.	41405.	57005.	67025.

TABLE B-2

COEFFICIENTS USING MIXED DATA

Range	960 to 970	970 to 980	980 to 990	990 to 1000	1000 to 1010	1010 to 1020	1020 to 1030	1030 to 1040	1040 to 1045
Dam to 1-A	.0396	.0548	.0285	.0220	.0249	.0264	.0275	.0274	.0320
1-A to 2-A	.1839	.0998	.0729	.0684	.0670	.0732	.0807	.0853	.1000
2-A to 3-A	1.2082	.1365	.0943	.0556	.0577	.0650	.0699	.0729	.0844
3-A to 7-A to 4-A to 10-A	28.7	.0909	.0514	.0480	.0641	.0678	.0680	.0652	.0683
4-A to 5-A to 8-A	-	.1273	.0467	.0244	.0295	.0394	.0420	.0414	.0447
5-A to 6-A	-	-	.0070	.0127	.0140	.0184	.0233	.0285	.0340
6-A to 9-A	-	-	.0001	.0339	.0221	.0354	.0478	.0524	.0617
9-A to Upstream	-	-	-	-	.0100	.0318	.0637	.0380	.1052
14-A to 15-A	-	-	-	-	-	-	-	.0830	.0950
8-A to 12-A	-	-	.0443	.1003	.0899	.1022	.1082	.1111	.1245
12-A to 13-A	-	-	-	-	.2214	.1616	.1412	.1305	.1515
13-A to 14-A	-	-	-	-	-	.0252	.1157	.1008	.1025
10-A to Upstream	-	-	-	.0086	.0193	.0512	.0809	.1058	.1401
7-A to 11-A	-	-	.0334	.0621	.0990	.1064	.0829	.0827	.0960
11-A to Upstream	-	-	-	-	-	.0001	.0122	.0460	.0917
15-A to 16-B to 17-AB	-	-	-	-	-	-	-	.0367	.0934
16-B to Upstream	-	-	-	-	-	-	-	-	.0193

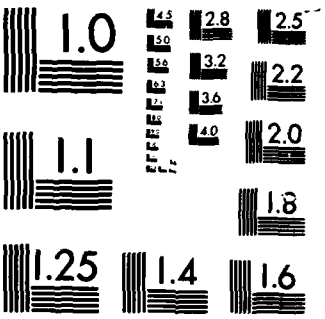
TABLE B-3

CROSS SECTION AREA OF SEDIMENT RANGE LINES, IN SQUARE FEET, 1978 SURVEY

Range	960 to 970	970 to 980	980 to 990	990 to 1000	1000 to 1010	1010 to 1020	1020 to 1030	1030 to 1040	1040 to 1045
1-A	210	1350	4950	9190	10550	11200	11880	12470	6670
2-A	20	930	4400	11280	18140	19880	20650	21360	11050
3-A	0	690	2770	14990	15730	15820	15880	16610	8570
4-A	0	30	980	3950	9470	10390	10810	14310	5840
5-A	0	0	40	4670	10470	11230	11770	12090	6370
6-A	0	0	0	500	11380	17080	17990	18470	10070
7-A	0	0	500	1400	2510	3590	4890	5630	3280
8-A	0	0	490	1890	5250	5970	6720	7480	4180
9-A	0	0	0	0	120	1410	2610	4130	2430
10-A	0	0	0	380	2890	3470	4020	4540	2410
11-A	0	0	0	0	0	0	200	2370	1450
12-A	0	0	0	0	120	1570	2440	2880	1660
13-A	0	0	0	0	0	90	660	2570	1750
14-A	0	0	0	0	0	0	20	1230	1370
15-A	0	0	0	0	0	0	0	320	500
16-B	0	0	0	0	0	0	0	0	20
17-AB	0	0	0	0	0	0	0	0	0
18-B	0	0	0	0	0	0	0	0	0
19-B	0	0	0	0	0	0	0	0	0
20-B	0	0	0	0	0	0	0	0	0

AD-A150 294 W KERR SCOTT RESERVOIR SEDIMENTATION RESURVEYS FOR MAY 2/2
1978 AND SEPTEMBER 1979(U) CORPS OF ENGINEERS
CHARLESTON SC CHARLESTON DISTRICT MAR 80

UNCLASSIFIED F/G 8/8 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TABLE B-4
CAPACITY (AC-FT)

(Using 1978 Survey Data)

Range	960 to 970	970 to 980	980 to 990	990 to 1000	1000 to 1010	1010 to 1020	1020 to 1030	1030 to 1040	1040 to 1045
Dam to 1-A	8.32	73.98	141.08	202.18	262.70	295.68	326.70	341.68	213.44
1-A to 2-A	42.30	227.54	681.62	1400.15	1922.23	2275.06	2625.17	2885.70	1772.00
2-A to 3-A	24.16	221.13	676.13	1460.61	1954.30	2320.50	2553.45	2768.01	1655.93
3-A to 7-A to 4-A to 10-A	0	65.45	218.45	994.56	1961.46	2255.71	2420.80	2679.07	1372.83
4-A to 5-A to 8-A	-	3.82	70.52	256.44	743.11	1087.05	1230.60	1402.63	732.63
5-A to 6-A	-	-	.28	65.66	305.90	520.90	693.41	870.96	558.96
6-A to 9-A	-	-	-	16.95	254.15	654.55	984.68	1184.24	771.25
9-A to Upstream	-	-	-	-	1.20	44.84	166.25	156.94	255.64
14-A to 15-A	-	-	-	-	-	-	-	128.65	177.65
8-A to 12-A	-	-	21.71	189.57	482.76	770.59	991.11	1151.00	727.08
12-A to 13-A	-	-	-	-	26.57	268.26	437.72	711.23	516.62
13-A to 14-A	-	-	-	-	-	2.27	78.68	383.04	319.80
10-A to Upstream	-	-	-	3.27	55.78	177.66	325.22	480.33	337.64
7-A to 11-A	-	-	16.70	86.94	248.49	381.98	421.96	661.60	454.08
11-A to Upstream	-	-	-	-	-	0	2.44	109.02	132.96
15-A to 16-B to 17-AB	-	-	-	-	-	-	-	11.74	48.57
16-B to Upstream	-	-	-	-	-	-	-	-	.39
Total	75.	592.	1826.	4676.	8219.	11055.	13258.	15926.	10047.
Accumulated Total	75.	667.	2493.	7169.	15388.	26443.	39701.	55627.	65674.

APPENDIX C

SELECTED PHOTOGRAPHS

Ground views taken 21 November 1978.
Aerial views taken 30 November 1978.

Photograph 1: Old Highway 268 cut between sediment ranges 4-A and 5-A. Pool elevation 1020.55.

Photograph 2: Looking downstream at old Highway 268 cut between sediment ranges 4-A and 5-A. Pool elevation 1020.55.

Photograph 3: Looking upstream at old Highway 268 cut above sediment range 2-A. Pool elevation 1020.55.

1

2

3

Photograph 4: Looking upstream on Warrior Creek above sediment range 9-A. Pool elevation 1020.55.

Photograph 5: Looking upstream on Punkin Creek above confluence with Warrior Creek. Pool elevation 1020.55.

Photograph 6: Aerial view of Warrior Creek above sediment range 9-A. Pool elevation 1020.00.

4

5

6

Photograph 7: Aerial view of Punkin Creek just above confluence with Warrior Creek. Note delta formation at lowered pool elevation. Pool elevation 1020.00.

Photograph 8: Aerial view of Blood Creek in vicinity of N. C. Highway 268. Note delta formation at lowered pool elevation. Pool elevation 1020.00.

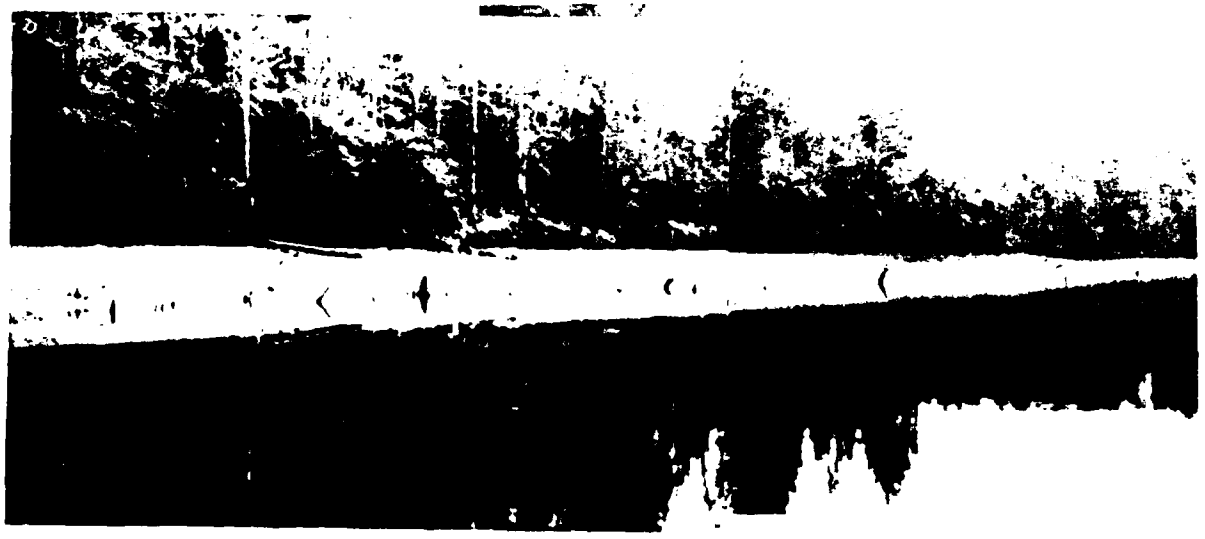
7

8

Photograph 9: Left bank Yadkin River looking upstream just above sediment range 12-A. Pool elevation 1020.55.

Photograph 10: Aerial view of Yadkin River just above sediment range 12-A. Note sediment deposition in slack water area. Pool elevation 1020.00.

Photograph 11: Aerial view of Marley's Ford where sediment samples S-1A and S-1B were taken. Boat ramp is completely silted in. Pool elevation 1020.00.



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Photograph 12: Aerial view of Yadkin River immediately downstream of sediment range 13-A. Pool elevation 1020.00.

Photograph 13: Looking downstream Yadkin River from sediment range 13-A. Pool elevation 1020.55.

Photograph 14: Looking upstream Yadkin River from sediment range 13-A. Note drop off at water's edge. Deposited sediment is being carried downstream during low pool condition. Pool elevation 1020.55.

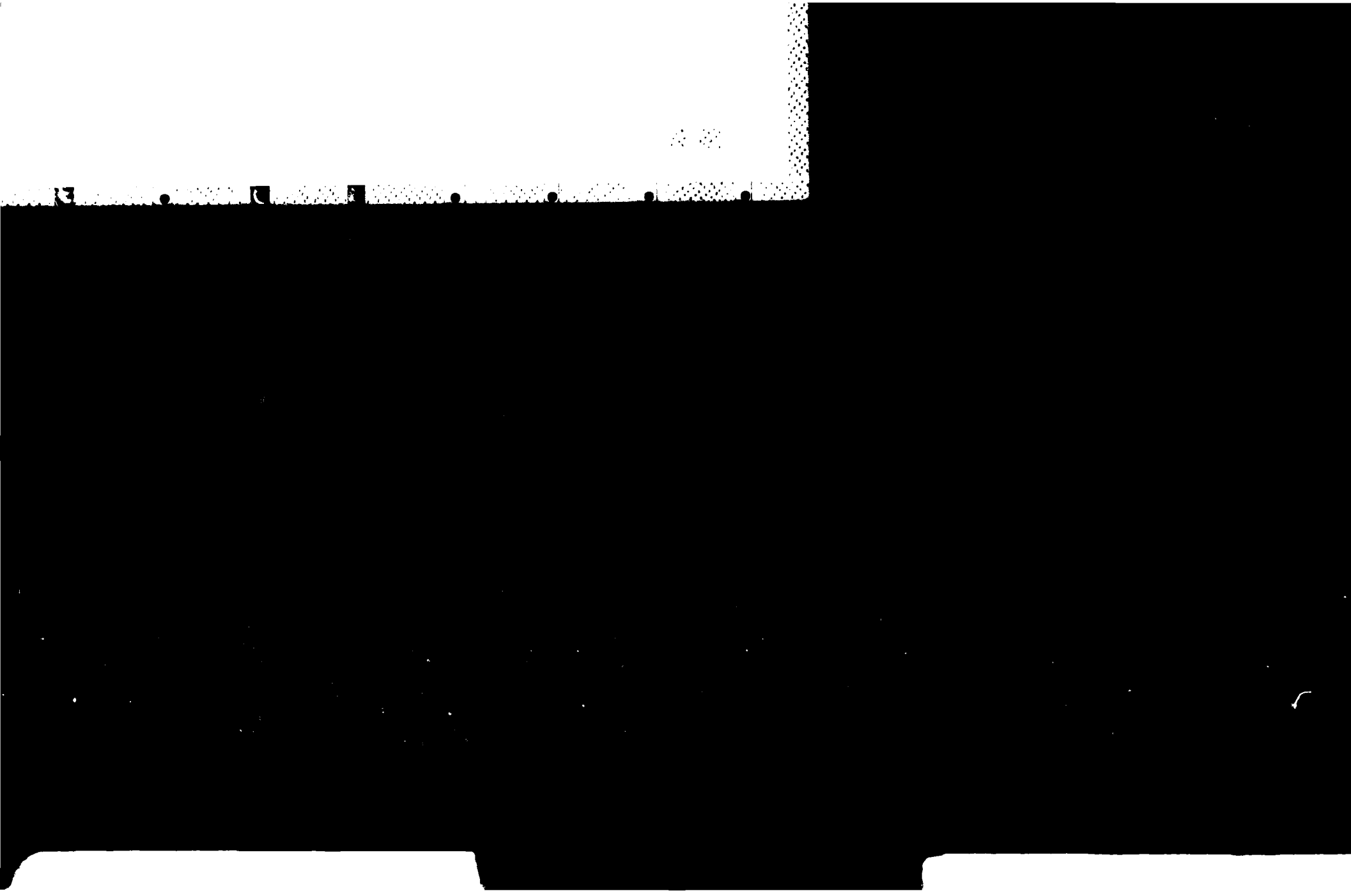
Photograph 15: Looking upstream Yadkin River from sediment range 13-A. Pool elevation 1020.55.


12


13


14


15



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17

18

Photograph 16: Aerial view of Yadkin River immediately upstream of sediment range 13-A. Pool elevation 1020.00.

Photograph 17: Aerial view of Yadkin River just downstream of sediment range 14-A. Pool elevation 1020.00.

Photograph 19: Confluence of Lewis Fork Tributary with Lewis Fork Creek between sediment ranges 7-A and 11-A. Pool elevation 1020.55.

Photograph 20: Aerial view of Lewis Fork Creek at sediment range 11-A. Pool elevation 1020.00.

Photograph 21: Looking upstream Lewis Fork Creek from confluence with Lewis Fork Tributary. Pool elevation 1020.55.

Photograph 22: Looking upstream Lewis Fork Creek above confluence with Lewis Fork Tributary. Sediment sample S-3 taken here. Note drop off and layering of sediment. Deposited sediment is being carried downstream during low pool condition. Pool elevation 1020.55.

19

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21

END

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